WRIGHTIA

A Botanical Journal

VOLUME 5

Numbers 1-9 and Index

1972–1977

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PUBLISHED BY
THE UNIVERSITY OF TEXAS AT DALLAS
RICHARDSON, TEXAS

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. Contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume contains a series of numbers issued at irregular intervals.

Frontispiece

Yucca filifera Chabaud, on Mexican plateau south of Saltillo, Coahuila. Photograph by C. L. Lundell, 1934 University of Michigan Expedition to Charcas, San Luis Potosi.

Printed in the U.S.A.
Etheridge Printing Company
Dallas, Texas

CONTENTS OF VOLUME 5

Complete in Nine Numbers

Number 9, May 20, 1977

May 20, 1977

WRIGHTIA

VOLUME 5 AUGUST, 1972 NUMBER 1

STUDIES OF AMERICAN PLANTS – V

CYRUS LONGWORTH LUNDELL

In continuation of the exploration of Guatemala, under the sponsorship of the Lundell Herbarium, Elias Contreras has collected a fine series of specimens in Baja Verapaz and Izabal. The 1972 collections contain novelties and significant new plant records.

The flora of the great lowland rain forest at the base of the Yucatan Peninsula is still very inadequately known, for only the most accessible sectors have been visited by collectors. Even less is known about the forests of the foothills and mountain masses of adjacent areas of British Honduras and Guatemala.

CELASTRACEAE

Maytenus grisea Lundell, sp. nov. – Arbor excelsa; ramuli glabri; folia glabra, petiolata, petiolo 5–8 mm. longo, canaliculato; lamina coriacea, grisea, elliptica, oblongo-elliptica vel obovata, 8.5–18 cm. longa, 3–7 cm. lata, apice obtusa vel rotundata, basi acutiuscula, subintegra; pedicelli fructiferi 3–6 mm. longi, fasciculati; sepala parva, late ovata, 0.5–0.6 mm. longa, acuta, eroso-ciliolata; capsula ovoidea, usque ad 1.8 cm. longa, 1.5 cm. lata, grisea.

A giant tree, the branchlets rather slender, terete, glabrous, drying grayish; leaves rather large, petiolate, the petioles rather stout, corrugated, 5–8 mm. long, shallowly canaliculate; leaf blades elliptic, oblong-elliptic or obovate, 8.5–18 cm. long, 3–7 cm. wide, apex obtuse or rounded, base acutish, coriaceous, margin subentire, midvein narrow, elevated on both surfaces, the lateral veins very slender, sharply ascending, both surfaces drying grayish; flowers fascicled in the leaf axils and on old wood; pedicels of fruit stout, terete, enlarged at base, 3–6 mm. long, glabrous; sepals minute, thin, broadly ovate or triangular, 0.5–0.6 mm. long, much wider, acutish, the margin erose-ciliolate; immature dry fruits bladdery, thin walled, ovoid, up to 1.8 cm. long, 1.5 cm. wide, apex rounded or subtruncate, base rounded or depressed medially, vertically veiny, drying pale gray, loculicidally 2-valvate, 1-seeded, the erect immature seed arillate.

Guatemala: Dept. Peten, La Cumbre, in high forest on top of rocky hill bordering Rio Pusila, May 18, 1967, *Elias Contreras 6944* (LL, type), tree, 70 ft. high, 20 in. diameter, fruit green.

The large thin-walled, bladdery fruits, rounded or depressed at base, are very distinctive, and totally unlike those of any other species known from Mexico and Central America.

Maytenus mayana Lundell, sp. nov. — Frutex glaber, ca. 1 m. altus, ramulis gracilibus; folia parva, petiolata, petiolo, 2.5–4.5 mm. longo; lamina subcoriacea, pallida, obscure crenulata, anguste oblongo-elliptica vel lanceolato-oblonga, 2–6 cm. longa, 0.6–1.8 cm. lata, apice subacuminata vel obtusiuscula, basi acutiuscula; flores parvi, axillares, fasciculati; pedicelli 2–2.5 mm. longi; sepala 5, late ovata, 0.7–0.9 mm. longa, eroso-ciliata; petala ovato-elliptica, ca. 2 mm. longa, apice rotundata; discus 1.8–2.2 mm. diam.; stylus crassus; ovarium biloculare.

Shrub, 1 m. high; branchlets slender, with short internodes, glabrous, sharply quadrangular with distinct ridges; leaves small, glabrous, petiolate, the petioles canaliculate, 2.5–4.5 mm. long; leaf blades pale green, obscurely crenulate, subcoriaceous, narrowly oblong-elliptic or lanceolate-oblong, 2–6 cm. long, 0.6–1.8 cm. wide, apex subacuminate or obtusish, base acutish, the midvein raised above as a narrow ridge, wider and elevated beneath, the lateral veins slender beneath, 4–6 pairs, not evident above; flowers small, axillary, solitary or fasciculate, glabrous; pedicels slender, terete, 2–2.5 mm. long; calyx shallow, the 5 sepals free, fleshy, broadly ovate, 0.7–0.9 mm. long, erose-ciliate; petals 5, ovate-elliptic, about 2 mm. long, fleshy, rounded at apex; disk fleshy, annular when dry, 1.8–2.2 mm. in diam.; stamens borne at edge of disk, the filaments awl-shaped, up to 0.8 mm. long, tapering above; anthers small, broadly ovate; ovary 2-celled; style stout, about 0.7 mm. long.

Guatemala: Dept. Peten, La Cumbre, Chacalte, in wet land, bordering high forest, km. 155 of road, Feb. 17, 1971, *Elias Contreras 10536* (LL, type), shrub, 3 ft. high, flowers yellowish.

Very close to *M. guatemalensis* Lundell, but differing notably in its very small mostly oblong leaves. The flowers are very small.

SAPINDACEAE

Cupania verapazensis Lundell, sp. nov. — Arbor, 25-metralis, ramulis minute adpresse hispidulis; folia longe petiolata; foliola parva, 6–14, petiolulo supra sulcato, 2–4 mm. longo; lamina chartacea, integra, glabrata, lanceolato-elliptica vel elliptico-oblonga, 3–6.5 cm. longa, 1.3–2.4 cm. lata, apice obtusa, subacuminata, basi acuta; inflorsecentia parva, pauciflora, minute adpresse puberula, usque ad 10 cm. longa, pedunculata; pedicelli fructiferi usque ad 3 mm. longi; sepala ovata, 1–1.3 mm. longa; capsula late turbinato-globosa, bilobata, usque ad 2 cm. longa, stipitata, glabrata.

A large tree, about 25 m. high, the branchlets rather slender, minutely hispidulous with closely appressed hairs; leaves small, the petiole and rachis canaliculate, minutely puberulent or appressed hispidulous, glabrate

in fruit; petiolules canaliculate, 2–4 mm. long; leaflets 6–14, lanceolate-elliptic or elliptic-oblong, 3–6.5 cm. long, 1.3–2.4 cm. wide, entire, the apex subacuminate, obtuse, the base acute and decurrent on petiolule, chartaceous, the midvein slightly elevated above, prominent beneath, the primary lateral veins 8–10 pairs, slender but conspicuous beneath, less evident above, areolate on both surfaces, very conspicuously domatiate in the nerve axils, with a few minute appressed hairs along midvein beneath, otherwise glabrous; inflorescences slender, few-flowered, narrowly paniculate, up to 10 cm. long, with long peduncles, minutely puberulent with appressed hairs; pedicels of fruits up to 3 mm. long; sepals ovate, 1–1.3 mm. long, appressed-puberulent; capsule broadly turbinate-globose, 2-celled, conspicuously emarginate and lobate, up to 2 cm. long including thick stipe up to 5 mm. long, appressed-puberulent at first, glabrate.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, Mar. 15, 1972, *Elias Contreras 11333* (LL, type), tree, 80 ft. high, 20 in. diam., fruit reddish.

Notable for its small domatiate entire leaflets, slender few-flowered inflorescences and 2-celled lobate capsules, *C. verapazensis* appears to have affinity to *C. dentata* DC.

MYRTACEAE

Eugenia flavida Lundell, Wrightia 3: 14. 1961.

McVaugh in the *Flora of Guatemala* (Fieldiana: Botany 24, pt. 7: 343. 1963) listed *E. flavida* as a synonym of *E. flavoviridis* Lundell. A series of collections from the type locality of *E. flavida*, around Dos Lagunas, Peten, show that the species is clearly the same as *E. Trikii* Lundell, and is a synonym of that species rather than *E. flavoviridis*. An isotype of *E. flavida* (LL) has a leaf with fine closely appressed dibrachiate hairs on undersurface as in the type of *E. Trikii*.

Eugenia verapazensis Lundell, sp. nov. – Frutex, 5–7 m., ramulis glabris; folia glabra, coriacea, petiolata, petiolo 3–6 mm. longo; lamina punctata, lanceolato-elliptica vel oblanceolata, 4–9 cm. longa, 1.8-3.5 cm. lata, apice acuminata, basi acutiuscula; inflorescentia racemosa; racemi abbreviati, ad 0.5 mm. longi, crassi, minute puberuli; pedicelli fructiferi crassi, ad 2 mm. longi; fructus oblongus vel subglobosus, ad 2 cm. longus; sepala parva, minute puberula; discus 2–2.5 mm. diam.

Shrub, 5–7 m. high, 7.5–12 cm. in diam., the branchlets rather slender but rigid, glabrous in fruit, angled; leaves glabrous, rigidly coriaceous, petiolate, the petioles drying blackish, rugose, canaliculate, 3–6 mm. long, rigid; leaf blades drying dark green above, paler beneath, lanceolate-elliptic or oblanceolate, 4–9 cm. long, 1.8–3.5 cm. wide, apex acuminate, the acumen obtusish, base acutish and decurrent, the midvein narrowly sulcate above, elevated beneath, the primary lateral veins slender, evident on both surfaces, 9–11 pairs, densely punctate; inflorescences axillary,

racemose, obscurely and minutely puberulent (in fruit), up to 5 mm. long, with thick rachis; pedicels of fruits thick, up to 2 mm. long; bracteoles very small, ovate; fruits oblong-ellipsoid or subglobose, up to 2 cm. long; persistent calyx obscurely puberulent, 4-lobed, the lobes broadly ovate, 1–1.5 mm. long; disk 2–2.5 mm. in diam.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, March 15, 1972, *Elias Contreras 11338* (LL, type), shrub, 15 ft. high, 3 in. diam., fruit blood-red. Also represented by *Contreras 11240* (LL) from the same locality.

MYRSINACEAE

Gentlea latisepala Lundell, sp. nov. — Frutex, ca. 5 m. altus; ramuli crassiusculi; folia glabra, petiolata, petiolo late marginato, 1.5–2 cm. longo; lamina coriacea, integra, obovato-elliptica vel obovata, 7.5–15 cm. longa, 3.8–7 cm. lata, basi subcuneata, apice acutiuscula vel subacuminata; inflorescentia paniculata, terminalis, 5–8 cm. alta et lata, parce glanduloso-papillosa; pedicelli crassi, 2–5 mm. longi; sepala 5, late ovata, ca. 3 mm. longa, 4 mm. lata, ciliata, punctata, apice rotundata; fructus subglobosus; stylus ca. 5 mm. longus.

Shrub, about 5 m. high, 7.5 cm. diam.; branchlets stout, glabrous, drying angulate; leaves glabrous, petiolate, the petioles thick, widely marginate, mostly 1.5–2 cm. long; leaf blades entire, coriaceous, paler beneath, obovate-elliptic or obovate, 7.5–15 cm. long, 3.8–7 cm. wide, subcuneate at base and decurrent on petiole, apex acutish, usually subacuminate, midvein impressed above, elevated beneath, the primary and secondary lateral veins slender and equally evident on both surfaces; inflorescences terminal, rather stout, paniculate, 5–8 cm. high, nearly as wide at base, the peduncle about 1 cm. long, appearing glabrous but with scattered minute papillose glands; flowers subcorymbose in fruit; pedicels thick, 2–5 mm. long, glandular-papillose; sepals 5, united at base, broadly ovate, about 3 mm. long, up to 4 mm. wide at base, ciliate, punctate, the margin thin, wide and mostly epunctate; young fruits subglobose, rugose-glandular; the persistent style slender, about 5 mm. long.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest on Concepcion Road, July 29, 1971, *Elias Contreras 10927* (LL, type), shrub, 15 ft. high, 3 in. diam., immature fruits reddish-brown.

G. micranthera (Donn. Sm.) Lundell is closely related to *G. latisepala*, but differs notably in its narrow sepals, nearly free to base, and with open rounded sinuses. The sepals of *G. latisepala* are strongly imbricate and wider than long. The short thick pedicels further distinguish *G. latisepala*. Only immature fruiting material is available.

Parathesis Travisae Lundell, sp. nov. — Frutex, ca. 4 m. altus, ramulis gracilibus, dense rufo-tomentellis; folia parva, petiolata, petiolo 5–10 mm. longo; lamina chartacea, subintegra, oblanceolata vel elliptico-lanceolata,

3.5–9 cm. longa, 1.2–3.8 cm. lata, apice subabrupte acuminata, basi acuta, supra pilosa; inflorescentia axillaris, gracilis, parva, pauciflora; flores umbellati; pedicelli 7–11 mm. longi; sepala 1 mm. longa, triangularia; corolla ca. 4.5 mm. longa, intus dense villosa; stamina parva, ca. 1.5 mm. longa; ovarium rufo-puberulum, stylo ca. 3 mm. longo; ovula 7 vel 8; fructus parce hirtellus.

Shrub, about 4 m. high, 7.5 cm. in diam.; branchlets slender, densely ferruginous-pubescent, the hairs dark red, simple and dendroid, the latter usually stellate apically; leaves small, petiolate, the petioles pubescent like the twigs, canaliculate, narrowly marginate, 5–10 mm. long; leaf blades chartaceous, obscurely crenulate-denticulate, subentire, pellucid-punctate, oblanceolate or elliptic-lanceolate, 3.5–9 cm. long, 1.2–3.8 cm. wide, apex subabruptly acuminate, the acumen short and acutish to obtuse, base acute, upper surface short-pilose with simple hairs, reddish pubescent beneath with stellate stipitate hairs, densely so along the costa, the midvein impressed above, prominent beneath, the primary lateral veins slender, 7–9 pairs, slightly impressed on upper surface; inflorescences axillary, short, with 1 to 3 terminal umbels, 3–5 cm. long, the peduncles slender, pubescent with dendroid and stellate hairs; flowers 5 or fewer, umbellate; pedicels slender, 7–11 mm. long, heterotrichous with simple short unequal hairs; sepals triangular, united about one-third at base, the calyx about 1.5 mm. long, the sepals 1 mm. long, acute, puberulent dorsally with red hairs, punctate with pallid glands; corolla about 4.5 mm. long, the petals united about 0.5 mm. at base, narrowly lanceolate, pubescent dorsally with short hairs, densely villous-tomentose internally with long conspicuous hairs, glabrous at base, punctate with pallid orange glands; stamens small, about 1.5 mm. long; filaments very short, less than 0.5 mm. long, the anthers appearing subsessile; anthers erect, lanceolate, about 1.3 mm. long, apiculate, epunctate or with a single small black gland dorsally; ovary ovoid, ferruginous-pubescent to base, the basal hairs shortest; style slender, 3 mm. long, the basal third pubescent with dendroid hairs; placenta depressed-globose; ovules 7 or 8, uniseriate, enclosed; fruits red, globose, drying up to 9 mm. in diam., persistently hirtellous.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest on top of hill, on Concepcion Road, 6 km. east of the village, July 27, 1971, *Elias Contreras 10893* (LL, type), shrub, 12 ft. high, 3 in. diam., flowers white.

P. Travisae has affinity to *P. Schultesii* Lundell and *P. pleurobotryosa* Donn. Sm. The anthers of the latter are entirely different. Flowers of *P. Schultesii* are not known, but that shrub of Oaxaca has larger altogether different leaves and fruits rather densely pubescent over the entire surface. *P. Travisae* is a notable addition to the genus.

The species is named for Mrs. Lillian Travis Harvey in recognition of her significant contributions to my studies of the Myrsinaceae, in particular the preparation of the monograph of the genus *Parathesis*.

SAPOTACEAE

Pouteria calophylloides (Lundell) Lundell, comb. nov. *Sideroxylon calophylloides* Lundell, Contr. Univ. Mich. Herb. 6: 56. 1941, not *Micropholis calophylloides* Pierre, 1891. *Micropholis mexicana* Gilly ex Cronquist, Lloydia 9: 257. 1946.

I am following Baehni in considering *Micropholis* a synonym of *Pouteria*.

Pouteria petenensis Lundell, sp. nov. — Arbor excelsa; ramuli crassi; folia novella rufo-sericea, petiolata, petiolo usque ad 5 cm. longo; lamina chartacea, obovata vel obovato-elliptica, 15–30 cm. longa, 6–15 cm. lata, apice obtusa, raro late acuminata, acumine obtuso, basi rotundata et acutiuscula, costis 10–14-jugis; pedicelli fructiferi subnulli, raro ad 3 mm. longi, crassi; sepala parva, 4 vel 5, rufo-sericea, late ovata, imbricata, ca. 2 mm. longa; ovario 4–5-loculare; fructus subglobosus.

Tree up to 30 m. high, the branchlets thick, the tips of the branchlets, the buds and young leaves densely covered with red closely appressed hairs, the mature growth glabrous; leaves large, petiolate, the petioles up to 5 cm. long, narrowly canaliculate above; leaf blades glabrous at maturity, thin, chartaceous, obovate or obovate-elliptic, 15–30 cm. long, 6–15 cm. wide, apex broadly obtuse, sometime short acuminate with obtuse acumen, base rounded and acutish, midvein prominent beneath, shallowly depressed above, the primary lateral veins slender but conspicuous, 10–14 pairs, the intermediaries evident on both surfaces, the surface paler beneath; fruits (immature) subsessile, the thick pedicels not over 3 mm. long, the fruits single or clustered at defoliated nodes; sepals 4 or 5, small, imbricate, broadly ovate or rounded, about 2 mm. long, 3 mm. wide, sometimes apiculate, pubescent with closely appressed red hairs; fruits (immature) depressed-globose, up to 4.5 cm. wide, 3 cm. high, both apex and base usually depressed medially, the surface scurfy with conspicuous scales; locules 4 or 5.

Guatemala: Dept. Peten, La Cumbre, on Cadenas Road, in high forest bordering the village, Sept. 26, 1966, *Elias Contreras 6240* (LL, type), tree, 90 ft. high, 18 in. diam., fruit chocolate-brown; Mar. 20, 1967, *Contreras 6793* (LL), tree, 60 ft. high, 14 in. diam., fruit yellow-gray; San Pedro, Cadenas Road, in high forest, Aug. 13, 1967, *Contreras 7011* (LL), tree, 90 ft. high, 30 in. diam., fruit chocolate; Cadenas, Sarstun River bank, east of the river, west of km. 170 of road, in high forest, Aug. 11, 1969, *Contreras 8897* (LL), tree, 70 ft. high, 18 in. diam., fruit green-gray.

This fine tree may be related to *P. lucentifolia* (Standl.) Baehni of Costa Rica and Panama, a species known to me only from Cronquist's brief description (Lloydia 9: 264. 1946). The fruits of *P. petenensis* are conspicuously scurfy with large scales.

RUBIACEAE

Chiococca petenensis Lundell, sp. nov. – Frutex scandens, ramulis gracilibus, glabris; stipulae rotundatae, abrupte subulatae; folia glabra, membranacea, petiolata, petiolo 3–8 mm. longo; lamina lanceolata vel ovata, 5–10.5 cm. longa, 2–4 cm. lata, apice acuminata, basi acuta; inflorescentia glabra, paniculata; pedicelli 1.5–3 mm. longi; calyx dentatus, dentibus triangularibus acutis; corolla ca. 7.5 mm. longa, lobis lanceolatis, ca. 3 mm. longis, obtusis; antherae 3 mm. longae; filamenta 1 mm. longa, pilosa.

A glabrous woody vine with slender branchlets; stipules rounded, abruptly subulate; leaves glabrous, very thin, membranaceous, petiolate, the petioles slender, 3–8 mm. long, canaliculate; leaf blades drying brownish, lanceolate or ovate, 5–10.5 cm. long, 2–4 cm. wide, apex acuminate, base acute and decurrent on petiole, the midvein narrowly impressed above, elevated beneath, the slender lateral nerves 5–7 pairs, evident on both surfaces; inflorescences glabrous, paniculate with slender peduncle and branches, the peduncle 1–3.5 cm. long, the bracts and bractlets linear or lanceolate, small; pedicels 1.5–3 mm. long, rarely longer; hypanthium and calyx glabrous, 2.5–3 mm. long, the hypanthium subequaling calyx, the calyx lobes triangular, about 0.8 mm. long, acutish, puberulent inside; corolla yellow, subcylindrical, 7.5 mm. long, including lobes about 3 mm. long, the lobes nearly erect, lanceolate, obtuse, the throat 2–2.5 mm. in diameter; stamens included in tube; anthers linear, 3 mm. long; filaments 1 mm. long, pubescent; stigma bilobed.

Guatemala: Dept. Peten, Dolores, in high forest on Santo Toribio trail, about 200 m. west, June 7, 1961, *Elias Contreras 2439* (LL, type), woody vine, flowers yellow.

The small flowers with subcylindrical corolla tube are noteworthy.

Chiococca pueblensis Lundell, nom. nov. *Chiococca pubescens* Standl., Contr. U. S. Nat. Herb. 20: 209. 1919, not H. & B. ex Roem. & Schult.

Chiococca rubriflora Lundell, sp. nov. – Frutex scandens, ramulis gracilibus, glabris; stipulae rotundatae, abrupte subulatae; folia glabra, petiolata, petiolo 4–7 mm. longo; lamina subchartacea, ovato-elliptica vel oblongo-elliptica, 7–10 cm. longa, 3–5 cm. lata, apice subabrupte acuminata, basi acuta; inflorescentiae racemosae, axillares, pauciflorae; pedicelli 6–11 mm. longi; hypanthium cum calyce glabrum; sepala parva, rotundata, apice apiculata, intus strigillosa; corolla rubra, glabra, 1.8–2 cm. longa, lobis lineari-lanceolatis, usque ad 7 mm. longis, obtusis; fructus subcompressus.

Woody vine, minutely and densely lenticellate, glabrous, the branchlets slender; stipules broadly rounded, abruptly subulate; leaves glabrous, with slender petioles, the petioles 4–7 mm. long, canaliculate; leaf blades thin, chartaceous, ovate-elliptic or oblong-elliptic, 7–10 cm. long, 3–5 cm. wide, apex subabruptly acuminate, base acute and decurrent on petiole,

costa slightly elevated on both surfaces, the primary lateral veins 4 or 5 pairs, obscure beneath, slender but inconspicuous above, slightly paler beneath; racemes solitary in the leaf axils, short, the peduncle and rachis 2–5 cm. long, few-flowered, glabrous; pedicels slender (4) 6–12 mm. long, the small bractlets linear; calyx and hypanthium 3–3.5 mm. long at anthesis, glabrous outside, the calyx less than half as long as hypanthium, the lobes very short, rounded and apiculate, ciliolate, the calyx minutely strigillose on inner surface; corolla large, dark red outside, orange within, 1.8–2 cm. long, glabrous, the tube slender below, 5–6.5 mm. in diam. at throat, the lobes reflexed, shorter than tube, linear-lanceolate, up to 7 mm. long, rounded-obtuse at apex; stamens included, about 9 mm. long, the filaments pubescent, the slender anthers about 5 mm. long; fruit large, ovoid-oblong to subglobose, only slightly compressed, up to 1 cm. in diam.

Guatemala: Dept. Peten, in *corozal*, west of km. 165 of Poptun road, Sept. 10, 1969, *Elias Contreras 9110* (LL, type), woody vine, flowers dark red outside, orange inside.

Other collections from Peten are all in fruit: on *pinal* trail, Tikal, *Lundell 16691* (LL); Tikal National Park, on Uaxactun trail, *Lundell 17132* (LL); El Pucte, below Sayaxche, *Lundell 18257* (LL); and, west of km. 165, Poptun road, *Contreras 9110* (LL).

The large red flowers up to 2 cm. long, leaves with lateral veins obscure on undersurface, calyx strigillose within, and few-flowered short solitary racemes with long pedicels are distinctive features of the species. Its affinity appears to be with *C. pachyphylla* Wernham of Mexico, a shrub or tree which has large many-flowered panicles, small altogether different flowers, and leaves distinctly veined on lower surface.

Chiococca vestita Lundell, sp. nov. — Frutex scandens; ramuli dense puberuli; stipulae cuspidatae; folia hirtella, petiolata, petiolo 4–8 mm. longo; lamina membranacea, ovata vel lanceolato-elliptica, 4–9.5 cm. longa, 1.5–4.2 cm. lata, basi subabrupte acuta, apice acuminata; inflorescentia axillaris, dense hirtella, anguste paniculata, 2–6 cm. longa, pauciflora; pedicelli fructiferi 1.5–4 mm. longi; fructus globosus, ca. 5 mm. diam.; calyx hirtellus, ca. 1 mm. longus, lobis acutis.

Woody vine, the branchlets slender, terete, densely puberulent; stipules cuspidate, the slender cusp up to 1.5 mm. long; leaves petiolate, the petioles slender, canaliculate, 4–8 mm. long, hirtellous; leaf blades membranaceous, ovate or lanceolate-elliptic, 4–9.5 cm. long, 1.5–4.2 cm. wide, base subabruptly acute and decurrent, apex acuminate, hirtellous on both surfaces, rather sparsely, the midvein nearly plane above, elevated and pale beneath, the primary veins slender, 4 or 5 pairs; inflorescence axillary, densely hirtellous, narrowly paniculate, 2–6 cm. long, with basal branch, the peduncle short, 1–2 cm. long; fruiting pedicels 1.5–4 mm. long, finely and densely hirtellous; fruits globose, compressed, drying 5 mm. in diam.,

hirtellous; the calyx crowning the fruits hirtellous, about 1 mm. long, the lobes triangular, acute.

Guatemala: Dept. Peten, Poptun, 2 km. east, in hammock in pineland, July 13, 1959, *C. L. Lundell 16425* (LL, type), woody vine, fruits white.

Chiococca vestita Lundell var. **glaberrima** Lundell, var. nov. – Frutex scandens, omnino glaber.

Woody vine, differing from the species in being entirely glabrous except for minutely ciliolate calyx lobes.

Guatemala: Dept. Peten, Poptun, 2 km. east, in hammock in pineland, July 13, 1959, *C. L. Lundell 16425A* (LL, type), woody vine, fruits white.

COLLECTIONS OF MYRSINACEAE FROM PANAMA AND ADJACENT AREAS

Cyrus Longworth Lundell

In connection with my contribution of the family Myrsinaceae for the *Flora of Panama* [Ann. Missouri Bot. Gard. 58(3): 285–353, figs. 1–20. 1971], a list of the collections from Panama and adjacent areas was prepared. Specimens studied in this connection are in the following herbaria:

Arnold Arboretum (A)

British Museum (BM)

Copenhagen (C)

Field Museum (F)

Gray Herbarium (GH)

Kew (K)

Lundell Herbarium (LL)

Missouri Botanical Garden (MO)

New York Botanical Garden (NY)

Paris (P)

Stockholm (S)

University of California, Berkeley (UC)

University of Michigan (MICH)

U. S. National Herbarium (US)

Yale University (Y)

The alphabetical list of collectors and the identifications of their collections will be useful to students of the flora of the region.

Allen, Paul H.
71 *Ardisia rigidifolia* Lundell
72 *Ardisia opegrapha* Oerst.
148 *Ardisia revoluta* Kunth
284 *Stylogyne Standleyi* Lundell
321 *Ardisia furfuracella* Standl.
786 *Ardisia opegrapha* Oerst.
865 *Ardisia Bartlettii* Lundell
929 *Ardisia guianensis* (Aubl.) Mez
953 *Ardisia revoluta* Kunth
1013 *Ardisia microcalyx* Lundell
1352 *Parathesis glabra* Donn. Sm.
1487 *Ardisia opaca* Lundell
1598 *Parathesis Seibertii* Lundell
1614 *Ardisia revoluta* Kunth
1846 *Ardisia opegrapha* Oerst.
2056 *Ardisia Pittieri* Mez
2083 *Rapanea myricoides* (Schlecht.) Lundell
2176 *Ardisia Pittieri* Mez
2226 *Ardisia opegrapha* Oerst.
2271 *Ardisia Pittieri* Mez
2450 *Stylogyne* aff. *Standleyi* Lundell
2571 *Ardisia subcoriacea* Lundell
2577 *Ardisia opegrapha* Oerst.
2661 *Ardisia opegrapha* Oerst.
2741 *Ardisia glomerata* Lundell
3418 *Ardisia antonensis* Lundell
3485 *Parathesis Seibertii* Lundell
3535 *Ardisia opegrapha* Oerst.
3561 *Ardisia opegrapha* Oerst.
3806 *Ardisia Pittieri* Mez
3965 *Weigeltia spectabilis* (Standl.) Lundell
4023 *Ardisia copeyana* Standl.
4068 *Ardisia revoluta* Kunth
4404 *Ardisia opegrapha* Oerst.
4579 *Ardisia Allenii* Lundell
4658 *Rapanea myricoides* (Schlecht.) Lundell
4709 *Rapanea pellucido-punctata* (Oerst.) Mez
4739 *Ardisia furfuracella* Standl.
4803 *Grammadenia linearifolia* Lundell
4869 *Rapanea Allenii* Lundell
4991 *Ardisia crassipes* Lundell
5396 *Grammadenia acuminata* Lundell

Alston, A. H. G.
8719 *Ardisia opegrapha* Oerst.
8855 *Ardisia Alstonii* Lundell

Alston, A. H. G. and Paul H. Allen
1852 *Ardisia Alstonii* Lundell

Andrè, Edouard Francois
1151 *Weigeltia Schlimii* (Hook. f.) Mez

Antonio C., H.
48 *Grammadenia marginata* Benth.

Aviles, Silvestre
100 *Ardisia guianensis* (Aubl.) Mez

Bartlett, H. H. and T. Lasser
16720 *Ardisia Bartlettii* Lundell

Blum, Kurt E.
1378 *Ardisia nigropunctata* Oerst.
2234a *Ardisia revoluta* Kunth

Blum, Kurt E. and J. A. Duke
2184 *Ardisia obovalifolia* Lundell
2196 *Ardisia obovalifolia* Lundell

Blum, Kurt E. and John D. Dwyer
2092 *Ardisia revoluta* Kunth

Blum, Kurt E., S. Olson and R. Rasmussen
2382 *Ardisia opegrapha* Oerst.

Blum, Kurt E. and Ed Tyson
1869 Ardisia revoluta Kunth
2316 Ardisia pellucida Oerst.
Brenes, A. M.
20530 Weigeltia spectabilis (Standl.) Lundell
Bristan, Narciso
468 Ardisia tenuis Lundell
593 Ardisia darienensis Lundell
1064 Ardisia Allenii Lundell
1236 Ardisia glanduloso-marginata Oerst.
Brown, Marjorie
41 Stylogyne Standleyi Lundell
Burch, D., R. L. Oliver and K. R. Robertson
1299 Ardisia revoluta Kunth
Carpenter, Ray
53 Stylogyne Standleyi Lundell
Castañeda, R. Romero
1756 Ardisia Romeroi Cuatr.
Chrysler, M. A.
4796 Ardisia Bartlettii Lundell
Cooper, G. Proctor
370 Ardisia stenophylla Donn. Sm.
463 Parathesis tenuifolia Lundell
463A Rapanea punctata (Lam.) Lundell
547 Ardisia guianensis (Aubl.) Mez
10474 Ardisia stenophylla Donn. Sm.
Cooper, G. Proctor and G. M. Slater
67 Stylogyne turbacensis (Kunth) Mez
119 Stylogyne turbacensis (Kunth) Mez
153 Parathesis panamensis Lundell
Correa A., Mireya D.
309 Rapanea myricoides (Schlecht.) Lundell
Correa A., Mireya D. and R. L. Dressler
462 Ardisia Dwyeri Lundell
472 Parathesis amplifolia Lundell
855 Rapanea myricoides (Schlecht.) Lundell
Cuatrecasas, Jose
11702 Grammadenia alpina Mez
14647 Grammadenia marginata Benth.
19143 Grammadenia alpina Mez
Davidson, M. E.
364 Ardisia subsessilifolia Lundell
379 Parathesis glabra Donn. Sm.
540 Ardisia subsessilifolia Lundell
614 Rapanea myricoides (Schlecht.) Lundell (mixture in some herbaria)
614 Rapanea pellucido-punctata (Oerst.) Mez (mixture in some herbaria)
633 Rapanea pellucido-punctata (Oerst.) Mez
777 Ardisia microcalyx Lundell
842 Ardisia Alstonii Lundell
874 Ardisia Maxonii Standl.
907 Parathesis glabra Donn. Sm.
969 Ardisia Maxonii Standl.
987 Ardisia glanduloso-marginata Oerst.
Dodge, C. W. and P. H. Allen
17072 Stylogyne Standleyi Lundell
Dodge, C. W. and V. F. Goerger
9283 Weigeltia spectabilis (Standl.) Lundell

Dodge, C. W., A. A. Hunter, J. A. Steyermark and Paul H. Allen
16638 *Ardisia revoluta* Kunth
16898 *Rapanea panamensis* Lundell

Dryander, Mrs. E.
2326 *Parathesis fusca* (Oerst.) Mez
2341 *Parathesis fusca* (Oerst.) Mez

Duke, J. A.
3880 *Parathesis fusca* (Oerst.) Mez
5025 *Ardisia Romeroi* Cuatr.
5335 *Ardisia tenuis* Lundell
5381 *Ardisia Romeroi* Cuatr.
5483 *Ardisia perinsignis* Lundell
5665 *Ardisia* aff. *guianensis* (Aubl.) Mez
5692 *Ardisia guianensis* (Aubl.) Mez
5844 *Ardisia guianensis* (Aubl.) Mez, vel aff.
5854 *Parathesis fusca* (Oerst.) Mez
5998 *Rapanea panamensis* Lundell
6561 *Ardisia darienensis* Lundell
8015 *Ardisia obovalifolia* Lundell
8028 *Ardisia glanduloso-marginata* Oerst.
8532 *Ardisia guianensis* (Aubl.) Mez
8650 *Ardisia opegrapha* Oerst. (leaves are a mixture)
8650 *Ardisia glomerata* Lundell (fruits are a mixture)
8658 *Rapanea myricoides* (Schlecht.) Lundell
8741 *Ardisia Dukei* Lundell
8824 *Ardisia Allenii* Lundell
8965 *Ardisia guianensis* (Aubl.) Mez
9199 *Rapanea pellucido-punctata* (Oerst.) Mez
9251 *Stylogyne Standleyi* Lundell
9423 *Ardisia obovalifolia* Lundell
9466 *Parathesis amplifolia* Lundell
10270 *Ardisia Allenii* Lundell
10612 *Ardisia Bartlettii* Lundell
11680 *Ardisia colombiana* Lundell
11847 *Ardisia revoluta* Kunth
12197 *Ardisia Pittieri* Mez
12545 *Rapanea panamensis* Lundell
13008 *Ardisia Allenii* Lundell
13024 *Ardisia pellucida* Oerst.
13088 *Ardisia pellucida* Oerst.
13150 *Ardisia nervosissima* Lundell
13235 *Ardisia Alstonii* Lundell
14089 *Ardisia Allenii* Lundell
14148 *Stylogyne Standleyi* Lundell
14154 *Ardisia pellucida* Oerst.
14387 *Ardisia pellucida* Oerst.
15229 *Ardisia palmana* Donn. Sm.

Duke, J. A. and M. Correa
14692 *Ardisia glomerata* Lundell
14715 *Rapanea myricoides* (Schlecht.) Lundell

Duke, J. A. and John D. Dwyer
13964 *Ardisia glomerata* Lundell
15132 *Ardisia nervosissima* Lundell

Duke, J. A. and T. E. Elias
E13662 *Ardisia* aff. *Dukei* Lundell
E13693 *Parathesis montana* Lundell
13750 *Ardisia darienensis* Lundell
13762 *Ardisia tenuis* Lundell

Duke, J. A. and B. R. Lallathin
14968 *Ardisia nervosissima* Lundell

14989 Ardisia glomerata Lundell
15004 Ardisia nervosissima Lundell
Duke, J. A. and N. Nickerson
14905 Stylogyne Hayesii Mez
Dunlap, V. C.
529 Rapanea punctata (Lam.) Lundell
539 Ardisia guianensis (Aubl.) Mez
Duss, Pere
3479 Grammadenia parasitica (Sw.) Griseb.
Dwyer, John D.
1250 Rapanea panamensis Lundell, vel. aff.
1288 Stylogyne turbacensis (Kunth) Mez
1290 Stylogyne turbacensis (Kunth) Mez
1314A Stylogyne turbacensis (Kunth) Mez
1433 Ardisia pellucida Oerst.
1612 Ardisia opegrapha Oerst.
1673 Ardisia revoluta Kunth
2190 Ardisia opegrapha Oerst.
2285 Ardisia granatensis Mez
2364 Ardisia revoluta Kunth
2441 Stylogyne turbacensis (Kunth) Mez
2692 Ardisia revoluta Kunth
3127 Ardisia revoluta Kunth
4351 Ardisia Fendleri Lundell
4354 Ardisia lilacina Lundell
6566 Stylogyne Standleyi Lundell
7166 Ardisia solanacea Roxb.
Dwyer, John D. and Mireya D. Correa A.
7938 Ardisia glomerata Lundell
Dwyer, John D. and J. A. Duke
7880 Ardisia nigrita Lundell
Dwyer, John D., L. H. Durkee, T. B. Croat and J. R. Castillon
4476 Ardisia Pittieri Mez
Dwyer, John D., G. Gauger and K. Baker
7281 Ardisia obovalifolia Lundell
Dwyer, John D. and S. M. V. Hayden
7658 Parathesis Seibertii Lundell
7695 Ardisia furfuracella Standl.
8078 Ardisia obovalifolia Lundell
8082 Ardisia Dwyeri Lundell
8092 Ardisia nigrita Lundell
Dwyer, John D. and J. H. Kirkbride, Jr.
7818 Ardisia picturata Lundell
Dwyer, John D. and Andrè Robyns
48 Stylogyne Standleyi Lundell
66 Stylogyne Standleyi Lundell
Ebinger, John E.
182 Ardisia Bartlettii Lundell
751 Ardisia opegrapha Oerst.
761 Ardisia Alstonii Lundell
1060 Stylogyne turbacensis (Kunth) Mez
1095 Ardisia revoluta Kunth
Endres, M.
1876 (year) Ardisia opegrapha Oerst.
Erlanson, C. O.
50 Ardisia guianensis (Aubl.) Mez
373 Ardisia guianensis (Aubl.) Mez
545 Ardisia guianensis (Aubl.) Mez
Ernst
1689 Parathesis laxa Lundell
Fendler, A.
314 Ardisia Fendleri Lundell
319 Ardisia lilacina Lundell

Fernandez, A.
251 *Ardisia megistophylla* Lundell
Frost, S. W.
75 *Stylogyne Standleyi* Lundell
Gentle, Percy H.
2990 *Stylogyne guatemalensis* Blake
Godfrey, R. K.
66363 *Ardisia nigropunctata* Oerst.
Graham, Shirley A.
228 *Ardisia revoluta* Kunth
Hart, John H.
127 *Ardisia* aff. *guianensis* (Aubl.) Mez
136 *Ardisia nigropunctata* Oerst.
Hayden, Sister M. Victoria
95 *Ardisia Bartlettii* Lundell
Hayes, Sutton
26 *Ardisia guianensis* (Aubl.) Mez
662 *Stylogyne Hayesii* Mez
707 *Ardisia colombiana* Lundell
Holdridge, L. R.
6242 *Ardisia Alstonii* Lundell
Hunter, A. A. and Paul H. Allen
247 *Ardisia guianensis* (Aubl.) Mez
458 *Stylogyne Standleyi* Lundell
517 *Stylogyne turbacensis* (Kunth) Mez
Johnston, Ivan M.
93 *Ardisia guianensis* (Aubl.) Mez
441 *Rapanea panamensis* Lundell
464 *Ardisia guianensis* (Aubl.) Mez
589 *Ardisia guianensis* (Aubl.) Mez
1741 *Stylogyne Standleyi* Lundell
1790 *Ardisia revoluta* Kunth
Karsten
s.n. (F) *Grammadenia Lehmannii* Mez
Kellerman, W. A.
6627 *Stylogyne laevis* (Oerst.) Mez
6701 *Stylogyne laevis* (Oerst.) Mez
Killip, E. P.
34984 *Ardisia granatensis* Mez
Killip, E. P. and Jose Cuatrecasas
38835 *Ardisia granatensis* Mez
Killip, E. P. and Albert C. Smith
15891 *Grammadenia alpina* Mez
Kirkbride, Joseph H. Jr.
113 *Parathesis Seibertii* Lundell
134 *Parathesis Seibertii* Lundell
216 *Ardisia Bartlettii* Lundell
1046 *Ardisia Fendleri* Lundell
1099 *Rapanea* (probably undescribed)
Kirkbride, Joseph H. Jr. and James A. Duke
683 *Ardisia nigropunctata* Oerst.
728 *Ardisia nigropunctata* Oerst.
900 *Ardisia subsessilifolia* Lundell
989 *Ardisia rigidifolia* Lundell, vel aff.
1034 *Ardisia Alstonii* Lundell
1041 *Rapanea pellucido-punctata* (Oerst.) Mez, vel aff.
1265 *Ardisia tenuis* Lundell
1340 *Parathesis montana* Lundell
1642 *Ardisia opegrapha* Oerst.
Lawrance, A. E.
530 *Weigeltia Schlimii* (Hook.f.) Mez

Lehmann, F. C.
5579 Grammadenia marginata Benth.
Lewis, W. H., R. K. Baker, B. MacBryde and R. L. Oliver
2196 Ardisia revoluta Kunth
2219A Ardisia Alstonii Lundell
Lewis, W. H., W. H. Blackwell, Jr., J. Hawker, C. O. Little, J. W. Nowicke and R. L. Oliver
3493 Ardisia guianensis (Aubl.) Mez
Lewis, W. H., W. H. Blackwell, Jr., J. Hawker, J. W. Nowicke, R. L. Oliver, J. E. Ridgway, A. G. Robyns and S. E. Verhoek
3038 Ardisia opegrapha Oerst.
Lewis, W. H., D. Burch, J. D. Dwyer, T. S. Elias, N. Escobar, R. L. Oliver and K. R. Robertson
670 Ardisia revoluta Kunth
699 Ardisia revoluta Kunth
Lewis, W. H., T. B. Croat and J. Hawker
2808 Ardisia megistophylla Lundell
Lewis, W. H., J. D. Dwyer, T. S. Elias and K. R. Robertson
986 Ardisia nigropunctata Oerst.
Lewis, W. H., B. MacBryde, R. L. Oliver and J. E. Ridgway
1513 Ardisia aff. *furfuracella* Standl.
1801 Ardisia aff. *furfuracella* Standl.
1803 Ardisia opegrapha Oerst.
Lewis, W. H., J. W. Nowicke, J. E. Ridgway, A. G. Robyns, S. E. Verhoek and A. V. Zaborowski
2898 Ardisia aff. *guianensis* (Aubl.) Mez
2968 Ardisia aff. *guianensis* (Aubl.) Mez
Lewis, W. H., D. M. Porter, L. H. Durkee and R. K. Baker
5377 Ardisia Lewisii Lundell
McDaniel, Sidney
6877 Rapanea myricoides (Schlecht.) Lundell
6912 Ardisia opegrapha Oerst.
Martinez-Calderon, G.
19 Stylogyne oaxacana Lundell
541 Stylogyne oaxacana Lundell
650 Stylogyne oaxacana Lundell
Maurice, Bro.
748 Ardisia Alstonii Lundell
Maxon, William R.
5108 Rapanea myricoides (Schlecht.) Lundell
5382 Ardisia Alstonii Lundell
5402 Ardisia Maxonii Standl.
Maxon, William R. and Alfred D. Harvey
6713 Ardisia guianensis (Aubl.) Mez
Miguel, P. Fray
46 Grammadenia pastensis Mez
Miller, Gerrit S.
1779 Stylogyne Standleyi Lundell
1782 Ardisia guianensis (Aubl.) Mez
2056 Ardisia colombiana Lundell
Molina R., Antonio
2125 Stylogyne nicaraguensis Lundell
Moritz, J. W. K.
1173 Grammadenia alpina Mez
Oersted, A. S.
30 Rapanea pellucido-punctata (Oerst.) Mez
30A Rapanea pellucido-punctata (Oerst.) Mez

31 *Stylogyne laevis* (Oerst.) Mez

Oliver, R. L.

591 *Rapanea myricoides* (Schlecht.) Lundell

2383 *Ardisia pellucida* Oerst.

Paul, Bro.

247 *Stylogyne Standleyi* Lundell

251 *Ardisia guianensis* (Aubl.) Mez

627 *Stylogyne Standleyi* Lundell

Peterson, N. F.

6644 *Ardisia granatensis* Mez

Pittier, H.

389 *Ardisia pleurobotrya* Donn. Sm.

2556 *Stylogyne Standleyi* Lundell

2607 *Stylogyne Standleyi* Lundell

2857 *Rapanea myricoides* (Schlecht.) Lundell

2976 *Ardisia Alstonii* Lundell

3117 *Ardisia Maxonii* Standl.

3167 *Ardisia Maxonii* Standl.

3226 *Ardisia* aff. *obovalifolia* Lundell

3255 *Ardisia panamensis* Lundell

3267 *Ardisia Scheryi* Lundell

3516 *Ardisia guianensis* (Aubl.) Mez

4001 *Stylogyne turbacensis* (Kunth) Mez

4114 *Ardisia lilacina* Lundell

4273 *Ardisia lilacina* Lundell

4311 *Ardisia lilacina* Lundell

4657 *Rapanea panamensis* Lundell

4725 *Ardisia guianensis* (Aubl.) Mez

5035 *Stylogyne turbacensis* (Kunth) Mez

5120 *Stylogyne turbacensis* (Kunth) Mez

7104 *Stylogyne laevis* (Oerst.) Mez

8624 *Stylogyne guatemalensis* Blake

Pittier, H. & Adolfo Tonduz

9173 *Ardisia stenophylla* Donn. Sm.

9586 *Ardisia stenophylla* Donn. Sm.

Porter, D. M., J. D. Dwyer, L. H. Durkee, M. R. Crosby, T. B. Croat, J. R. Castillon and R. K. Baker

4317 *Rapanea panamensis* Lundell

4422 *Ardisia Pittieri* Mez

Porter, D. M., M. R. Crosby and R. K. Baker

4597 *Ardisia Pittieri* Mez

Proctor, George R.

31891 *Ardisia subsessilifolia* Lundell

31907 *Ardisia panamensis* Lundell

31925 *Ardisia horquetensis* Lundell

32020 *Ardisia rufa* Lundell

32238 *Ardisia fimbrillifera* Lundell

Purpus, C. A.

5959 *Ardisia pellucida* Oerst.

7335 *Parathesis tartarea* Lundell

Rodriguez C., R. L.

489 *Parathesis glabra* Donn. Sm.

Rojas, Fernando Solis

152 *Ardisia glanduloso-marginata* Oerst.

Schlim, L.

686 *Weigeltia Schlimii* (Hook.f.) Mez

Schomburgk, R.

992 *Grammadenia lineata* Benth.

Seemann, B. C.
59 *Ardisia nigropunctata* Oerst.
540 *Ardisia guianensis* (Aubl.) Mez
560 *Stylogyne Standleyi* Lundell
1093 *Ardisia pulverulenta* Mez
s.n. *Ardisia revoluta* Kunth

Seibert, R. J.
456 *Ardisia opegrapha* Oerst.
1572 *Ardisia stenophylla* Donn. Sm.

Shattuck, Otis
532 *Stylogyne Standleyi* Lundell
611 *Ardisia Bartlettii* Lundell
718 *Stylogyne Standleyi* Lundell
1098 *Ardisia Bartlettii* Lundell

Skutch, Alexander F.
3538 *Ardisia glanduloso-marginata* Oerst.

Smith, Austin F.
34 *Ardisia glanduloso-marginata* Oerst.
H90 *Ardisia glanduloso-marginata* Oerst.

Smith, Herbert H.
2738 *Ardisia pellucida* Oerst.

Standley, Paul C.
26229 *Stylogyne Standleyi* Lundell
26277 *Ardisia revoluta* Kunth
26396 *Stylogyne Standleyi* Lundell
26561 *Stylogyne Standleyi* Lundell
27570 *Ardisia Bartlettii* Lundell
28139 *Ardisia guianensis* (Aubl.) Mez
28253 *Stylogyne Standleyi* Lundell
28290 *Stylogyne Standleyi* Lundell
28385 *Stylogyne Standleyi* Lundell
29335 *Ardisia guianensis* (Aubl.) Mez
29357 *Stylogyne Standleyi* Lundell
29366 *Ardisia guianensis* (Aubl.) Mez
29772 *Rapanea panamensis* Lundell
29948 *Ardisia guianensis* (Aubl.) Mez
31002 *Stylogyne Standleyi* Lundell
31430 *Stylogyne Standleyi* Lundell
31685 *Ardisia guianensis* (Aubl.) Mez
41029 *Ardisia Bartlettii* Lundell
41048 *Stylogyne Standleyi* Lundell

Standley, Paul C. and Juvenal Valerio
47122 *Ardisia Pittieri* Mez

Starry, D. E.
28 *Ardisia Bartlettii* Lundell
178 *Ardisia Bartlettii* Lundell

Stern, W. L. and K. L. Chambers
96 *Ardisia palmana* Donn. Sm.

Stern, W. L., K. L. Chambers, J. D. Dwyer and J. E. Ebinger
302 *Ardisia guianensis* (Aubl.) Mez
319 *Ardisia revoluta* Kunth
395 *Ardisia pellucida* Oerst.
569 *Ardisia pellucida* Oerst.
571 *Parathesis microcalyx* Donn. Sm.
1029 *Ardisia subsessilifolia* Lundell
1137 *Ardisia Maxonii* Standl.
1194 *Rapanea pellucido-punctata* (Oerst.) Mez

Stern, W. L., R. H. Eyde and E. S. Ayensu
1893 *Stylogyne turbacensis* (Kunth) Mez
1943 *Rapanea pellucido-punctata* (Oerst.) Mez
1946 *Rapanea myricoides* (Schlecht.) Lundell
2008 *Ardisia Maxonii* Standl.
2053 *Ardisia glanduloso-marginata* Oerst.

Steyermark, Julian A.
55503 *Grammadenia Lehmannii* Mez
57345 *Grammadenia alpina* Mez
58316 *Grammadenia lineata* Benth.
61624 *Grammadenia Lehmannii* Mez
62104 *Grammadenia Lehmannii* Mez
62520 *Grammadenia Lehmannii* Mez

Steyermark, Julian A. and Paul H. Allen
17072 *Stylogyne Standleyi* Lundell

Stimson, William R.
5362 *Ardisia solanacea* Roxb.

Stimson, William R. and R. J. Gardner
5439 *Ardisia solanacea* Roxb.

Stork, H. E.
1592 *Ardisia copeyana* Standl.

Stubel
360 & 248a *Grammadenia marginata* Benth.

Terry, M. E.
1347 *Ardisia glanduloso-marginata* Oerst.

Terry, M. E. and R. A. Terry
1490 *Weigeltia panamensis* Standl.
1563 *Ardisia darienensis* Lundell
1568 *Ardisia tenuis* Lundell

Tonduz, Adolfo
7460 *Ardisia palmana* Donn. Sm.
10787 *Ardisia subsessilifolia* Lundell
12632 *Ardisia palmana* Donn. Sm.
12839 *Parathesis microcalyx* Donn. Sm.
13369 *Ardisia Pittieri* Mez

Triana, J.
2594 *Weigeltia Schlimii* (Hook.f.) Mez
2595 *Weigeltia Schlimii* (Hook.f.) Mez

Tyson, Edwin L.
811 *Parathesis glabra* Donn. Sm.
813 *Ardisia glanduloso-marginata* Oerst.
819 *Parathesis glabra* Donn. Sm.
820 *Parathesis glabra* Donn. Sm.
866 *Ardisia reflexiflora* Lundell
1133 *Ardisia solanacea* Roxb.
3097 *Stylogyne turbacensis* (Kunth) Mez
3511 *Ardisia solanacea* Roxb.
3605 *Stylogyne turbacensis* (Kunth) Mez
3718 *Ardisia* aff. *furfuracella* Standl. (?)
3735 *Stylogyne turbacensis* (Kunth) Mez
4469 *Ardisia solanacea* Roxb.
5785 *Parathesis Seibertii* Lundell
6072 *Rapanea panamensis* Lundell

Tyson, Edwin L., J. Dwyer and Kurt Blum
3279 *Ardisia Tysonii* Lundell
3340 *Ardisia obovalifolia* Lundell

Tyson, Edwin L., J. Dwyer, K. Blum and J. Duke

4666 *Ardisia Allenii* Lundell
4702 *Ardisia pellucida* Oerst.

Ule, E. H.
6792 *Grammadenia asymmetrica* Mez

von Hagen, Christine and Wolfgang von Hagen
2005 *Ardisia glanduloso-marginata* Oerst.
2008 *Ardisia Hagenii* Lundell
2021 *Ardisia Maxonii* Standl.
2040 *Ardisia subsessilifolia* Lundell
2062 *Ardisia subsessilifolia* Lundell
2067 *Ardisia Maxonii* Standl.
2129 *Ardisia Scheryi* Lundell

von Wedel, H.
299 *Ardisia Wedelii* Lundell
617 *Ardisia stenophylla* Donn. Sm.
661 *Ardisia opegrapha* Oerst.
801 *Ardisia nigropunctata* Oerst.
932 *Ardisia opegrapha* Oerst.
974 *Ardisia nigropunctata* Oerst.
1109 *Ardisia opegrapha* Oerst.
1344 *Ardisia nigropunctata* Oerst.
1536 *Ardisia opegrapha* Oerst.
1769 *Ardisia opegrapha* Oerst.
2088 *Ardisia guianensis* (Aubl.) Mez
2135 *Ardisia guianensis* (Aubl.) Mez
2393 *Ardisia Wedelii* Lundell

Weberbauer, A.
6121 *Grammadenia Weberbaueri* Mez
7168 *Grammadenia Weberbaueri* Mez

Wetmore, R. H. and E. C. Abbe
118 *Stylogyne Standleyi* Lundell

White, Gene
19 *Parathesis Seibertii* Lundell
20 *Ardisia furfuracella* Standl.
48 *Ardisia Whitei* Lundell
58 *Parathesis glabra* Donn. Sm.
67 *Ardisia glanduloso-marginata* Oerst.
89 *Ardisia furfuracella* Standl.

White, Gene and Peggy White
85 *Ardisia opaca* Lundell

White, Peggy
14 *Ardisia pleurobotrya* Donn. Sm.
156 *Parathesis glabra* Donn. Sm.
172 *Ardisia glanduloso-marginata* Oerst.
193 *Rapanea myricoides* (Schlecht.) Lundell
215 *Ardisia furfuracella* Standl.

White, Peggy and Gene White
8 *Ardisia furfuracella* Standl.
27 *Parathesis Seibertii* Lundell
71 *Ardisia revoluta* Kunth

Wilbur, R. L., E. L. Dunn, H. A. Hespenheide and D. R. Wiseman
7495 *Grammadenia parasitica* (Sw.) Griseb.

Williams, Louis O., Alfonso Jimenez M. and Terua P. Williams
24167 *Grammadenia minor* Lundell

Williams, R. S.
719 *Parathesis microcalyx* Donn. Sm.

Wilson, C. L.
73 *Ardisia Fendleri* Lundell

Woodson, R. E. Jr. and R. W. Schery
230 *Ardisia Maxonii* Standl.
331 *Parathesis Seibertii* Lundell
384 *Parathesis glabra* Donn. Sm.

686 *Ardisia Scheryi* Lundell
906 *Ardisia Wagneri* Mez
944 *Ardisia geniculata* Lundell

Woodson, R. E. Jr., Paul H. Allen and R. J. Seibert

798 *Parathesis glabra* Donn. Sm.
897 *Ardisia glanduloso-marginata* Oerst.
967 *Ardisia Maxonii* Standl.
1239 *Ardisia opegrapha* Oerst.
1294 *Rapanea myricoides* (Schlecht.) Lundell
1569 *Ardisia Bartlettii* Lundell
1746 *Ardisia opegrapha* Oerst.

Woodworth, R. H. and P. A. Vestal

306 *Stylogyne Standleyi* Lundell
435 *Stylogyne Standleyi* Lundell
481 *Ardisia Fendleri* Lundell

WRIGHTIA[1]

VOLUME 5 FEBRUARY, 1974 NUMBER 2

STUDIES OF AMERICAN PLANTS – VI

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Although the Lundell Herbarium was transferred to The University of Texas at Austin on September 1, 1972 with discontinuance of the operations of Texas Research Foundation on that date, my research continues at Renner under the auspices of The University of Texas at Dallas. A working set of duplicate tropical American material is maintained for my use in studying accumulated collections from the Maya Area. As Adjunct Professor of Botany of The University of Texas at Austin, and Professor of Plant Sciences at Dallas, my research is co-sponsored by the two institutions. *Wrightia* will serve the staffs of both institutions as a botanical journal.

The excellent library in systematic botany, accumulated at Texas Research Foundation at Renner, is incorporated in The University Library of The University of Texas at Dallas. It comprises a significant part of The Lundell Collection of The University Library. The Lundell Rare Book Library is housed in the Humanities Research Center of The University of Texas at Austin.

In the identification of collections, primarily those of Percy H. Gentle, Elias Contreras, Eizi Matuda, and my own from British Honduras, Guatemala and Mexico, unnamed material mostly in the Annonaceae, Monimiaceae, Lauraceae, Guttiferae, Rosaceae, Flacourtiaceae, and Myrtaceae has received current attention. Most of the species described or noted in this issue of *Wrightia* are in these families.

ANNONACEAE

Annona volubilis Lundell, sp. nov. – Frutex scandens, ramulis novellis rufo-tomentosis; folia petiolata, petiolo canaliculato, rufo-tomentoso, 4–7 mm. longo; lamina membranacea, subtus glauca, pilosa, supra glabrata, lanceolata, oblonga vel oblanceolata, 4.5–10 cm. longa, 1.6–3.1 cm. lata, apice acuminata, basi rotundata et acutiuscula, nervi laterales utrinque 8 vel 9; flores solitarii; pedicelli rufo-tomentosi, 5–7 mm. longi; sepala connata, e basi latissima conspicue acuminato-apiculata, rufo-tomentosa; petala 3, crassa, rigida, tomentella, late ovata, ad 1.6 cm. lata, 1.3 cm. longa; stamina 2.8–3 mm. longa, connectivi apice incrassato, muriculato; ovaria adpresse hirsuta, stylis oblongis, ca. 1 mm. longis, muriculatis.

Woody vine, the slender branchlets elongated, enlarged at the nodes, at first rufous-tomentose; leaves alternate, petiolate, the petioles rufous-tomentose, canaliculate, 4–7 mm. long; leaf blades membranaceous, green

[1]Published by The University of Texas at Dallas, Box 30365, Dallas, Texas 75230.

above, glaucous beneath, lanceolate, oblong or oblanceolate, 4.5–10 cm. long, 1.6–3.1 cm. wide, apex acuminate or subabruptly acuminate, base rounded, sometimes acutish, the midvein rufous-tomentose, impressed above, elevated beneath, the upper surface glabrous with age, the lower surface persistently pilose, the marginal hairs reddish, the primary lateral veins 8 or 9 pairs, without conspicuous domatia; flowers depressed ovoid-pyramidal, up to 2.5 cm. in diam. at anthesis, solitary, the pedicels rufous-tomentose, 5–7 mm. long, with lanceolate bracts up to 2.5 mm. long; sepals 3, connate at base, rufous-tomentose, ovate-rounded, 5–6 mm. wide, about 4 mm. long including acumen, the apex subabruptly apiculate-acuminate; petals 3, thick, up to 1.6 cm. wide, 2 cm. long, finely tomentellous on inside and outside; stamens numerous, 2.8–3 mm. long, the filament about 0.6 mm. long, the connective expanded into a broad hood above pollen sacs, its surface minutely muriculate; carpels numerous, the ovaries hirsute with ascending appressed hairs, bearing thick oblongish styles about 1 mm. long, minutely muriculate; torus rounded, hirsute.

Guatemala: Dept. Peten, La Cumbre, km. 141/142 of Cadenas Road, in high forest, May 14, 1967, *Elias Contreras 6899* (LL, type), vine, flowers greenish.

Referable to the Section Pilannona Safford, this is a remarkable species with affinity to *A. acuminata* Safford of Panama. Its scandent habit, leaves finely pilose and glaucous on undersurface, short pedicels, and the rufous-tomentose indument of branchlets, pedicels, petioles and leaf midvein are features to be noted. Another related species, *A. scandens* Diels of Peru has a similar habit, but its leaves are broadly elliptic or obovate, the pedicels are fully twice as long, and it does not have rufous-tomentose indument.

Cymbopetalum longissimum Lundell, sp. nov. — Arbor parva vel frutex; ramuli novelli pubescentes; folia novella subsericea, petiolata, petiolo crasso, 2–3 mm. longo; lamina subchartacea vel membranacea, oblonga vel lanceolato-oblonga, 12–19 cm. longa, 3–6 cm. lata, basi rotundata et acutiuscula, inaequilatera, apice acuminata, nervi laterales utrinque 12–15; flores solitarii, supra-axillares; pedicelli longissimi, 17–25 cm. longi, penduli; sepala late ovato-rotundata, ad 4.5 mm. longa, 5.5 mm. lata; petala minute adpresse tomentella, exteriora late elliptica vel ovato-elliptica, ad 1.2 cm. longa, interiora crasse carnosa, late elliptica, ad 2.5 cm. longa, 2 cm. lata; stamina ca. 3 mm. longa; monocarpia 3–5, ad 1.3 cm. longe stipitata, oblongo-cylindrica, torulosa, 4–5.5 cm. longa, ad 1.5 cm. diam., glabra.

Arborescent shrub, up to 5 m. tall, 7.5 cm. diam., the branchlets subsericeous with fine short subappressed hairs; leaf buds and tender leaves subsericeous at first; leaves large, petiolate, the petioles subsericeous, thick, 2–3 mm. long, canaliculate; leaf blades subchartaceous, glabrous except along the costa beneath, oblong or lanceolate-oblong, 12–19 cm. long, 3–6 cm. wide, base inaequilateral, rounded, acutish and decurrent on petiole, apex acuminate, the acumen acute and sometimes caudate, the costa prominent and somewhat elevated on both surfaces, the

primary lateral veins slender, 12–15 pairs, reticulation fine but evident on both surfaces; flowers supra-axillary, pendent, with slender elongated pedicels 17–27 cm. long, the pedicels at first rather sparsely subsericeous, glabrous at length except at apex and base; sepals broadly ovate-rounded, up to 4.5 mm. long, 5.5 mm. wide, broadly apiculate, nearly glabrous; outer petals thin, broadly elliptic or ovate-elliptic, up to 1.2 cm. long, the indument appressed, minute; inner petals very thick, involute-cymbiform with apex inflexed, broadly elliptic, up to 2.5 cm. long, 2 cm. wide, the indument appressed, minute; stamens numerous, about 3 mm. long, the apical connective of anthers thick, minutely papillate; carpels densely puberulent; fruits stipitate, oblong-cylindric, up to 1.5 cm. in diam., 4–5.5 cm. long including slender stipe 1–1.3 cm. long, 4–7-seeded, rounded and sulcate between seeds, glabrescent at maturity.

Guatemala: Dept. Izabal, Puerto Mendez, on San Felipe Road, 7 km. south, in *corozal*, Sept. 12, 1969, *Elias Contreras 9134* (LL, type), shrub, 15 ft. high, 2 in. diam., flowers yellow-green; Puerto Mendez, on Arenales Road, 1 km. NW, in *zapotal*, Sept. 11, 1969, *Contreras 9130* (LL), shrub, 6 ft. high, flowers green; Puerto Mendez, on top of rocky hill in *zapotal*, bordering the village, Aug. 13, 1966, *Contreras 5966* (LL), shrub, 20 ft. high, 2 in. diam., flowers greenish, "*anonillo*." Dept. Peten: Seamay, in high forest on rocky hill, March 11, 1967, *Contreras 6719* (LL), shrub, 20 ft. high, 3 in. diam., fruit dark green, "*anonillo*."

C. longissimum has long slender glabrescent pedicels like *C. longipes* Diels of Brazil and Peru, and is unlike any other species of Mexico and Central America in this feature. Among other differences, the long-stipitate glabrous fruits, and leaves with more numerous primary veins further mark the species.

Cymbopetalum mayanum Lundell, sp. nov. – Arbor, 13 m. alta, 25 cm. diam., ramulis novellis tomentellis; folia petiolata, petiolo crasso, 1.5–4.5 mm. longo; lamina membranacea, oblonga vel elliptica, 10–26 cm. longa, 5.5–8.5 cm. lata, apice acuminata, basi late rotundata; pedicelli tomentulosi, 4–11 cm. longi; sepala late ovata, 4–6 mm. longa, 5.5–7 mm. lata, minute tomentulosa, apiculata; petala exteriora plana, late ovato-elliptica, ad 2.5 cm. longa, 2.2 cm. lata, minute tomentulosa; petala interiora crassa, cymbaeforma, sulcata, obovato-orbicularia, 2–2.5 cm. longa, 2 cm. lata, minute tomentulosa; stamina numerosa; filamenta ca. 0.5 mm. longa; antherae ca. 3.5 mm. longae, apice truncatae, papillosae; carpella minute tomentella; stigma biloba, carnosa.

Tree, about 13 m. tall, 25 cm. diam., the branchlets finely tomentose; leaf buds appressed pubescent; leaves large, short petiolate, the petioles 2–4.5 mm. long, thickened, pubescent; leaf blades membranaceous, appressed pubescent along the midvein, especially at base on both surfaces, oblong or elliptic, 10–26 cm. long, 5.5–8.5 cm. wide, apex acuminate with obtusish acumen, base inaequilateral, broadly rounded, the costa nearly plane above, elevated beneath, the primary lateral veins slender but conspicuous on both surfaces, 9–12 pairs, the reticulation fine but equally evident on both surfaces; flowers supra-axillary, solitary, the pedicels

slender, tomentulose, up to 11 cm. long; sepals broadly ovate, 4–6 mm. long, 5.5–7 mm. wide, obtusely apiculate, finely tomentulose; outer petals thin, broadly ovate-elliptic, up to 2.5 cm. long, 2.2 cm. wide, usually smaller, minutely tomentulose; inner petals thick, cymbiform, obovate-orbicular, up to 2.5 cm. long, 2 cm. wide, mostly smaller, the margin strongly involute, deeply sulcate dorsally and appearing emarginate, the apex obtuse-rounded or rounded and inflexed; stamens numerous, about 4 mm. long including thick filament about 0.5 mm. long, the anthers with truncate minutely papillose thick connective at apex; carpels about 3.5 mm. long, minutely tomentose, the style and stigma large and fleshy, the stigma bilobed; receptacle depressed-globose, hirsute.

Guatemala: Dept. Peten, Tikal, in *ramonal* on main plaza, May 7, 1959, *C. L. Lundell 15964* (LL, type), tree, 10 in. diam., 40 ft. high, flowers yellowish.

Two fruiting specimens from Tikal, *Lundell 15499* (LL) and *17137* (LL) have stout rigid supra-axillary pedicels 4–6 cm. long and tomentulose. The fruits are smooth, oblong-cylindric, curved, rounded at apex, 4–6 cm. long, up to 2.4 cm. in diam., tapering at base into a thick stipe 1.5–2.2 cm. long, and tomentulose.

The tree is quite variable in such features as pedicel length, the pedicels varying from 4 to 11 cm. long. This is exceptional in the genus.

In the Lundell Herbarium, *C. mayanum* is represented by a large series of collections from the wet lowland forest at the base of the Yucatan Peninsula. The tree is common at Tikal. Collections of this species from the area have been referred by Standley and others to *C. penduliflorum* (Dun.) Baill. The fruits with stout stipes up to 2.2 cm. long, small broadly ovate sepals, and emarginate or rounded inner petals mostly about 2 cm. wide and long are among the differences which well mark *C. mayanum* as a distinct species.

Desmopsis erythrocarpa Lundell, sp. nov. — Arbor parva vel frutex, ramis gracilibus; ramuli novelli adpresse hirsuti; folia novella sericea, petiolata, petiolo 4–8 mm. longo; lamina membranacea, adulta subglabra, elliptica, lanceolato-elliptica vel obovato-elliptica, 6–17 cm. longa, 2.5–7.5 cm. lata, basi acuta vel acuminata, apice subabrupte caudato-acuminata; inflorescentia parce adpresse hirsuta; pedicelli 2.5–4.5 cm. longi; sepala ovato-lanceolata, 5–11 mm. longa, acuminata vel caudato-acuminata, parce sericea; petala ad 4 cm. longa, parce sericea; carpella subglobosa vel ellipsoidea, ca. 1.5 cm. longa, stipitata.

Small tree, about 6 m. high, 5 cm. diam., the branchlets slender, the branchlets, petioles and inflorescence at first pubescent, rather sparsely, with subappressed hairs with reddish-brown tinge; leaves at first sericeous on both surfaces, mostly glabrous at maturity with scattered hairs along veins, petiolate, the petioles 4–8 mm. long, canaliculate; leaf blades firmly membranaceous, slightly paler beneath, elliptic, lanceolate-elliptic or obovate-elliptic, 6–17 cm. long, 2.5–7.5 cm. wide, acute or acuminate at base, the apex subabruptly caudate-acuminate, the acute acumen up to 2.5 cm. long, the midvein narrowly impressed above, elevated beneath,

the primary lateral veins slender, arcuately ascending, mostly 8 or 9 pairs; inflorescence extra-axillary, 1–3-flowered, the peduncle very short, up to 2 mm. long, hirsute, the pedicels slender, 2.5–4.5 cm. long, with bractlet below middle; sepals ovate-lanceolate, 5–11 mm. long, acuminate or caudate-acuminate, sparsely pubescent with subappressed hairs; petals linear, expanded at base, up to 4 cm. long at anthesis, about 3.5 mm. in diam. medially, attenuate to apex, rather sparsely sericeous on both surfaces; stamens numerous; stigmas pubescent; fruits nearly glabrous, subglobose or ellipsoid, about 1.5 cm. long at maturity, dark red, conspicuously stipitate, the stipes about 8 mm. long.

Guatemala: Dept. Peten, Cadenas, bordering Rio Sarstun, in high forest of wet land, west of km. 170 of Poptun Road, Aug. 14, 1966, *Elias Contreras 5976* (LL, type), small tree, 20 ft. high, 2 in. diam., flowers yellow-green, "*anona.*" Dept. Izabal, Puerto Mendez, in high forest, bordering Rio Sarstun, 4 km., March 21, 1967, *Contreras 6809* (LL), shrub, 15 ft. high, fruit dark red, "*anonilla.*" Represented further by *Contreras 7808* (LL) from Chahal, Alta Verapaz; *Contreras 5912* (LL), *8973* (LL), *10861* (LL), from Puerto Mendez, Izabal; and, *Contreras 6727* (LL), from Cadenas, Peten.

I suspect that *D. erythrocarpa* has closest affinity to *D. Galeottiana* (Baill.) Saff. of Mexico, a species with obtuse leaf acumen and much smaller flowers. *D. Schippii* Standl. of British Honduras bears some resemblance, but its leaves obtuse at base and short acuminate, the shorter pedicels and petals, and sepals described as "sepala late ovata obtusa sericea 2.5 mm. longa" by Standley separate it from *D. erythrocarpa.*

Malmea Gaumeri (Greenm.) Lundell, comb. nov. *Guatteria Gaumeri* Greenman, Field Mus. Bot. 2: 251. 1907.

On the basis of its glabrous branchlets, strictly glabrous tender leaves, mostly subcoriaceous leaf blades, longer pedicels, inflorescence and sepals usually pubescent with appressed reddish hairs, and petals up to 4.5 cm. long, *M. Gaumeri* seems distinct from *M. depressa* (Baill.) R. E. Fries. The buds of *M. Gaumeri* are pubescent with reddish hairs, but otherwise, except for the inflorescence and flowers, the species is glabrous.

In some collections, notably *Lundell & Lundell 7432* (LL) from Yucatan and *Gentle 4769* (LL) from British Honduras, the fruits are distinctly mammose apically at maturity. In other collections the fruits are rounded apically, and the significance of this, if any, remains to be determined.

M. Gaumeri, rather than *M. depressa*, appears to be the species of the Yucatan Peninsula, although the leaves in most collections are much larger than described by Greenman.

Malmea guatemalensis Lundell, sp. nov. – Arbuscula, ca. 7 m. alta, 5 cm. diam., ramulis glabris; folia membranacea, glabra, petiolata, petiolo crasso, 4–8 mm. longo; lamina lanceolata, 12–23 cm. longa, 3–7 cm. lata, basi acuta vel rotundata et acutiuscula, apice attenuata, acuminata, reticulata; inflorescentiae terminales, unifloræ, circ. 3 mm. longe

pedunculatae, parce adpresse hirsutae; pedicelli ca. 1.8 cm. longi; sepala late rotundata, ca. 2 mm. longa, ciliata; petala ciliata, exteriora ovato-elliptica, ca. 1.8 cm. longa, 1.4 cm. lata, apice rotundata, interiora elliptica, 2.3–2.6 cm. longa, 1.3–1.5 cm. lata, stamina ca. 2 mm. longa.

Arborescent shrub, about 7 m. high, 5 cm. in diam., the branchlets slender, glabrous, drying blackish; buds hirsute with appressed reddish hairs; leaves large, glabrous, petiolate, the petioles thick, blackish, canaliculate, 4–8 mm. long, glabrous; leaf blades membranaceous, lanceolate, 12–23 cm. long, 3–7 cm. wide, base acute or rounded and acutish, decurrent, apex attenuate, acuminate, costa elevated and rounded on both surfaces, most prominent beneath, the primary veins slender, 10–12 pairs, nearly horizontal, anastomosing to form veins nearly 1 cm. from margin, the reticulation very open, conspicuous but with very slender veins; flowers terminal, the peduncle about 3 mm. long, with scattered appressed reddish hairs; pedicel about 1.8 cm. long, glabrous, with bracts medially, clavate above, drying blackish; sepals glabrous, broadly rounded, about 2 mm. long, ciliate; petals glabrous, the outer ovate-elliptic, about 1.8 cm. long, 1.4 cm. wide, broadly rounded at apex, the margin thin and sparingly ciliate; the inner petals larger, elliptic, 2.3–2.6 cm. long, 1.3–1.5 cm. wide, ciliate; stamens about 2 mm. long.

Guatemala: Dept. Alta Verapaz, Sebol, in high forest about 3 km. south on old Peten road, April 18, 1964, *Elias Contreras 4408* (LL, type), shrub, 20 ft. high, 2 in. diam., flowers yellow-green.

M. guatemalensis is notable for the peculiar open reticulation of the leaf blades with primary veins mostly horizontal and often angled. No other species of the family in Middle America has been observed with similar leaf venation.

The species may have affinity to *M. costaricensis* R. E. Fries, known to me only from description.

Malmea leiophylla (Donn. Sm.) Lundell, comb. nov. *Duguetia leiophylla* Donn. Sm., Bot. Gaz. 20: 281. 1895.

In the genus in Middle America, the "glandular-lepidote" indument of the peduncle, pedicel, and calyx is peculiar to this species. From description *M. leiophylla* has affinity to *M. guatemalensis* Lundell.

Why the species was never transferred to *Malmea* by either Fries or Standley is difficult to understand [Fries, Acta Hort. Berg. 10: 320. 1930; and, Standley, Fieldiana: Bot. 24 (pt. 4): 288. 1946]. It is not to be confused with either *M. depressa* (Baill.) R. E. Fries, as referred to that taxon by Fries (Acta Hort. Berg. 12: 538. 1939), or to *M. Gaumeri* (Greenm.) Lundell.

Oxandra belizensis (Lundell) Lundell, comb. nov. *Amyris belizensis* Lundell, Contr. Univ. Mich. Herb. 6: 32. 1941.

On the basis of its pellucid-punctate leaves, this species, known only from sterile material, was described as an *Amyris*. It appears to be an *Oxandra*. *O. maya* Miranda from Chiapas may be a synonym. However, from Miranda's description, the pubescence of *O. belizensis* does not match that of *O. maya*.

O. guatemalensis Lundell is closely related to *O. maya*, but differs in its larger elliptic leaves and fasciculate flowers.

A collection from British Honduras, *George R. Proctor 30104* (LL), collected April 25, 1969 in high forest, alt. 1600–1700 ft., 2.2 miles southeast of Holec Camp, Chiquibul Forest Reserve, El Cayo District, may represent another closely allied species. It leaves are mostly oblanceolate, and the flowers are solitary with pedicels up to 6 mm. long.

Oxandra guatemalensis Lundell, sp. nov. — Arbor, ramulis novellis puberulis; folia subsessilis; lamina subchartacea, anguste elliptica, 7–13 cm. longa, 2–4.2 cm lata, apice cuspidata, basi acutiuscula vel obtusiuscula, supra glabra, subtus novella pilosa; flores fasciculati, axillares; pedicelli ad 3.5 mm. longi, vestiti; sepala late ovato-rotundata, ca. 1 mm. longa, 1.5 mm. lata; petala 6, anguste elliptica, 5–6 mm. longa, ciliata; stamina 12, subsessilis, 2–2.5 mm. longa; carpella 4 vel 5; ovula 1, erecta.

Tree, about 20 m. tall, 30 cm. in diam., the branchlets slender, at first finely pubescent with spreading and subappressed hairs, glabrate; leaf buds finely pubescent with subappressed hairs; leaves punctate, subsessile, the short thickened petioles 1–2 mm. long, pubescent; leaf blades thin, membranaceous or subchartaceous, narrowly elliptic, 7–13 cm. long, 2–4.2 cm. wide, apex cuspidate-acuminate, base acutish or obtusish, glabrous above, sparsely pilose beneath, the spreading hairs persistent along the midvein, the midvein elevated beneath, nearly plane above, the veins very slender and inconspicuous; flowers axillary, fasciculate, small, the pedicels and bracts pubescent with fine small subappressed hairs, the bracts ovate, fleshy, about 1 mm. long; pedicels articulate above base, up to 3.5 mm. long; sepals 3, fleshy, broadly ovate-rounded, about 1 mm. long, 1.5 mm. wide; petals 6, elliptic or oblanceolate-elliptic, 5–6 mm. long, ciliate, rather thin; stamens 12, subsessile, 2–2.5 mm. long, the connective extended apically; carpels 4 or 5, sessile, the stigma clavate; ovule 1, erect.

Guatemala: Dept. Peten, El Ceibo, about 4 km. on El Repasto Road, on top of hill, March 30, 1965, *Elias Contreras 5379* (LL, type), tree, about 60 ft. high, 12 in. diam., flowers white, aromatic, "*nahuate*."

The genus *Oxandra* was reported from British Honduras on the basis of a determination of a sterile collection by R. E. Fries (Field Mus. Bot. 12: 137. 1936), but the genus was omitted from the *Flora of Guatemala*, with the collection named by Fries referred to *Malmea*.

MONIMIACEAE

Mollinedia angustata Lundell, sp. nov. — Arbor parva, 5–6 m. alta, ramulis novellis parce strigillosis; folia subchartacea, petiolata, anguste lanceolata, 8–18 cm. longa, 1.2–2.8 cm. lata, apice acuminata, basi cuneata, subintegra; inflorescentia mascula strigillosa, laxa, multiflora, paniculata; cymae triflorae, pedunculis ad 1.3 cm. longis, pedicellis ad 1.2 cm. longis; receptacula parva, turbinata, strigillosa, 3.5–4 mm. alta, ad 5 mm. diam., lobis ovatis, 1.5–2 mm. longis; stamina 10–15; pedicelli fructiferi ca. 2 cm. longi; drupa stipitata, ellipsoidea, ca. 2 cm. longa, basi strigillosa.

Small tree, 5–6 m. high, up to 10 cm. diam., the branchlets, petioles and midvein on lower leaf surface strigillose at first, rather sparsely so, the branchlets very slender; leaves thin, subchartaceous, glabrous at maturity, linear-lanceolate, 8–18 cm. long, 1.2–2.8 cm. wide, apex slender, long acuminate, base cuneate, the margin subentire or remotely denticulate, the midvein shallowly impressed above, prominent beneath, the numerous lateral veins slender but conspicuous on lower surface, reticulate, obscure above; staminate inflorescences strigillose, laxly many-flowered, paniculate, up to 3 cm. long, the cymes 3-flowered with slender peduncles up to 1.3 cm. long, the filiform pedicels up to 1.2 cm. long; receptacle small, turbinate, strigillose, 3.5–4 mm. high, up to 5 mm. in diam. at anthesis, the lobes subequal, ovate, 1.5–2 mm. long; stamens 10–15; fruiting peduncle about 2 cm. long, the torus elevated, pubescent, the drupes short stipitate, ellipsoid, about 2 cm. long, strigillose at base.

Guatemala: Dept. Baja Verapaz, Chilasco, on road to Concepcion, 5 km., on top of hill, July 27, 1971, *Elias Contreras 10889* (LL, type), small tree, 15 ft. high, 3 in. diam., flowers yellow-green; Chilasco, in high forest, on Concepcion Road, *Contreras 10925* (LL), small tree, 20 ft. high, 4 in. diam., fruit green.

Mollinedia flavida Lundell, sp. nov. — Arbor parva, 4 m. alta, ramulis glabris; folia flavida, glabra, petiolata, petiolo 4–6 mm. longo; lamina coriacea, anguste lanceolata vel oblongo-lanceolata, 7–14 cm. longa, 1.5–3.3 cm. lata, apice acuminata, basi cuneata, remote denticulata; inflorescentia mascula minute adpresse puberula, multiflora, ad 2.5 cm. longa, pedunculis ad 1 cm. longis, pedicellis ad 6 mm. longis, bracteatis; receptacula mascula turbinata, 5–6 mm. alta, ca. 7 mm. diam., lobis late ovatis, ca. 3 mm. longis; stamina 24 vel 25.

Small tree, 4 m. high, the branchlets slender, compressed at the nodes, glabrous; leaves firmly coriaceous, drying yellowish, glabrous, petiolate, the petioles 4–6 mm. long, canaliculate, drying blackish; leaf blades narrowly lanceolate or oblong-lanceolate, 7–14 cm. long, 1.5–3.3 cm. wide, apex attenuate, acuminate, base cuneate, the margin minutely and rather remotely denticulate, the midvein and primary veins slightly impressed above, elevated beneath, reticulate, the primary veins 7–9 pairs; staminate inflorescences at first puberulent with minute appressed hairs, drying blackish, up to 2.5 cm. long, the 3-flowered cymes with peduncles up to 1 cm. long, the pedicels up to 6 mm. long; receptacle turbinate, 5–6 mm. high, about 7 mm. in diam. at anthesis, the lobes subequal, broadly ovate, about 3 mm. long; stamens 24 or 25; pistillate flowers and fruits unknown.

Mexico: Chiapas, in woods, Cascada, near Siltepec, alt. 1600 m., March 4, 1945, *Eizi Matuda 5117* (LL, type), small tree, 4 m. high.

Mollinedia pallida Lundell, sp. nov. — Arbor parva, 5 m. alta, 7–10 cm. diam., ramulis glabris; folia glabra, petiolata, petiolo 5–7 mm. longo; lamina membranacea, discolor, subtus pallida, anguste lanceolata vel oblanceolata, 7.5–15 cm. longa, 1.5–4 cm. lata, serrulata, apice acuminata vel caudata, basi subcuneata; inflorescentia mascula paniculata, novella puberula; cymae triflorae, pedunculis ad 2 cm. longis, pedicellis ca. 5 mm.

longis; receptacula turbinata, ca. 5 mm. alta, 6 mm. diam., lobis ovatis, acutis; stamina 25; drupa glabra, ad 2 cm. longa.

Small tree, the branchlets glabrous, compressed, very slender; leaves glabrous, petiolate, the petioles slender, 5–7 mm. long, canaliculate; leaf blades thin, membranaceous, narrowly lanceolate or oblanceolate, 7.5–15 cm. long, 1.5–4 cm. wide, apex acuminate or caudate, base subcuneate, margin serrulate, usually with 3–5 conspicuous sharp teeth on each side above middle, sometimes subentire or denticulate, dull above, brownish and pallid beneath, the midvein impressed on upper surface, elevated beneath, the primary lateral veins 8–11 pairs, slender but evident on lower surface; staminate inflorescences terminal, paniculate, the panicles consisting of 3 or 4, 3-flowered cymes, puberulent above at first, the slender peduncles of cymes up to 2 cm. long, the pedicels about 5 mm. long; receptacle turbinate, about 5 mm. high, 6 mm. in diam. at anthesis, essentially glabrous at anthesis, the lobes unequal, the inner larger, the outer ovate, 3–4 mm. long, acutish; stamens 25; pistillate flowers unknown; immature drupes sessile, oblong-ellipsoid, up to 2 cm. long, glabrous; the fleshy torus 5–8 mm. in diam., elevated and rounded, pubescent.

Mexico: Chiapas, Mt. Ovando, December, 1937, *Eizi Matuda 2094* (LL, type), small tree, 5 m. high, 7–10 cm. diam., flowers yellow.

Mollinedia pauciflora Lundell, sp. nov. — Arbor parva, ramulis glabris; folia glabra, petiolata, petiolo 5–8 mm. longo; lamina flavida, subcoriacea, serrulata, lanceolata, oblongo-lanceolata vel oblanceolata, 8–16 cm. longa, 2.5–5.5 cm. lata, apice acuminata, basi subcuneata; inflorescentiae masculae pauciflorae, minute adpresse puberulae, cymosae, pedunculis ad 3 cm. longis, pedicellis 6–10 mm. longis; receptacula mascula late turbinata, 6–8 mm. alta, 8–10 mm. diam., lobis late ovatis, ad 5 mm. longis; stamina 33–35.

Small tree, the branchlets glabrous, slender, subcompressed at the nodes; leaves opposite, glabrous, drying yellowish, petiolate, the petioles 5–8 mm. long, canaliculate; leaf blades subcoriaceous, lanceolate, oblong-lanceolate or oblanceolate, 8–16 cm. long, 2.5–5.5 cm. wide, apex acuminate or caudate-acuminate, base subcuneate, the margin serrate with 7–9 teeth on each side, the teeth often extending to middle or below, mostly incurved, up to 1.5 mm. long, the midvein shallowly impressed above, elevated beneath, the primary lateral veins slender, 6 to 8 on each side, rather obscure above; staminate inflorescences up to 6 cm. long, bracteate at base, few-flowered, puberulent with fine appressed hairs, the cymes 1–3, 3-flowered, the peduncles slender, up to 3 cm. long, the pedicels 6–10 mm. long; perianth large, appressed-puberulent, turbinate, 6–8 mm. high, 8–10 mm. in diam. at anthesis, the lobes broadly ovate, up to 5 mm., mostly shorter; stamens 33–35; pistillate flowers and fruits unknown.

Mexico: Chiapas, Boqueron, near Motozintla, alt. 2540 m., May 5, 1945, *Eizi Matuda 5414* (LL, type), small tree.

The labelling by Matuda of his collections in 1945 has been a source of confusion. The first four sets of these were purchased, and these are in the Lundell Herbarium, most of the four sets of specimens being mounted and retained for study because of their critical nature. Since I was engaged in new postwar endeavors in Texas, I was unable at the time to provide identifications. Matuda distributed the remaining sets of the duplicates, prefacing the original collections with "1", thus the number of this collection at Field Museum and elsewhere became "15414" rather than "5414", the number of the collection in the Lundell Herbarium.

LAURACEAE

Licaria clavata Lundell, sp. nov. — Arbor parva, glabra, ramulis gracilibus; folia glabra, subchartacea, petiolata, petiolo 8–10 mm. longo; lamina anguste lanceolata, 7.5–13.5 cm. longa, 2–3.5 cm. lata, basi acuta, apice caudato-acuminata; inflorescentia axillaris, paniculata, pauciflora, 3–7 cm. longa, glabra; tepala crassa, ovata, ca. 1 mm. longa, glabra; stamina 3, libera, hirsuta; ovarium glabrum.

Tree, about 7 m. high, 7.5 cm. in diam.; branchlets slender, glabrous, drying blackish; buds glabrous, black; leaves alternate, thin, subchartaceous, glabrous, petiolate, the petioles slender, canaliculate, drying blackish below, mostly 8–10 mm. long; leaf blades narrowly lanceolate, 7.5–13.5 cm. long, 2–3.5 cm. wide, base acute, apex caudate-acuminate, the acumen slender, up to 3 cm. long, obtusish, midvein slender, elevated on both surfaces, primary veins quite slender, arcuately ascending, inconspicuous but even less so above, the venation fine, reticulate, areolate beneath, inconspicuous above; panicles axillary, very slender, glabrous, drying black, few-branched, few-flowered, 3–7 cm. long, with filiform peduncles 1.5–3 cm. long, the branches of panicles filiform, the flowers umbellate or subcorymbose; pedicels glabrous, slender, elongated, tapering into the perianth tube, giving a clavate appearance to flowers; flowers rounded apically with included anthers at anthesis, the anthers protruding after anthesis; perianth tube obconical, the tepals fleshy, ovate, about 1 mm. long, incurved, the inner slightly smaller, subequal, minutely ciliolate at first, pubescent at base within; stamens slightly connate at base, thick, fleshy, appressed pubescent, 1–1.4 mm. long, larger and extruding postanthesis; anthers broader than long, depressed-triangular, scarcely distinct from filaments, extrorse-apical, only the valves glabrous, staminodia small when present, no glands observed; ovary glabrous, the style equalling stamens; immature cupule thin, with thin obscure double margin, apically pubescent within, the thin margin irregular and ruptured in young fruiting stage.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest, on Concepcion Road, July 29, 1971, *Elias Contreras 10923* (LL, type), tree 20 ft. high, 3 in. diam., flowers greenish.

L. clavata resembles *L. caudata* (Lundell) Kosterm., but the latter may be segregated immediately by its minutely and densely punctate leaves. *L. clavata* is glabrous, except for the pubescence of inner surface of perianth tube and stamens, while *L. caudata* is pubescent.

Licaria conoidea Lundell, sp. nov. — Arbor parva, ramulis gracilibus; folia chartacea, glabra, petiolata, petiolo 5–8 mm. longo, canaliculato; lamina lanceolata vel anguste oblongo-elliptica, 10.5–20 cm. longa, 3.5–6 cm. lata, basi subcuneata, apice acuminata, nervis 6–8-paribus; inflorescentia paniculata, axillaris, 1–4 cm. longa; pedicelli fructiferi crassi, 1.5–2 cm. longi; cupula verrucosa, usque ad 12 mm. alta, 2.4 cm diam., lenticellata, margine duplice, exteriore usque ad 2 mm. lato, rugoso, interiore erecto, integro, 3–4 mm. alto; fructus ellipsoideus, usque ad 2 cm. longus, 1.4 cm. diam.

Tree, 8–10 m. high, 7.5–10 cm. diam.; branchlets slender, glabrous (in fruit), subterete, lenticellate; young buds hirsute with short appressed hairs; leaves glabrous, chartaceous, petiolate, the petioles slender, canaliculate and narrowly marginate, mostly 5–8 mm. long, drying blackish; leaf blades lanceolate or narrowly oblong-elliptic, 10.5–20 cm. long, 3.5–6 cm. wide, base subcuneate, narrowly decurrent on the petiole, apex acuminate, the acumen up to 2 cm. long, obtuse, costa and veins elevated on both surfaces, the midvein rather conspicuous, the 6 to 8 primary veins arcuately ascending, quite slender, the venation finely reticulate; fruiting panicles axillary, short, stout, lenticellate, 1–4 cm. long, the peduncles in fruit obscurely pubescent with short appressed hairs; berry ovoid-ellipsoid, smooth, up to 2 cm. long, 1.4 cm. in diam., apex truncate-rounded and depressed; cupule woody, up to 12 mm. deep within, up to 2.4 cm. wide, tapering into the thick enlarged petiole and cone-like, roughly verruculous and lenticellate, with remnants of fine pubescence, the outer margin patent, irregular, rigid, not over 2 mm. thick, inner one thinner, erect, entire, 3–4 mm. high, finely appressed pubescent on inner and outer surfaces; fruiting pedicel enlarged, cone-like, tapering into cupule, 1.5–2 cm. long.

Guatemala: Dept. Izabal, Puerto Mendez, 19 km. on Rio Dulce Road, in high forest, Sept. 14, 1970, *Elias Contreras 10277* (LL, type), tree, 25 ft. high, 3 in. diam.; Puerto Mendez, 10 km. on Rio Dulce Road, in high forest, Sept. 17, 1970, *Contreras 10290* (LL), tree, 30 ft. high, 4 in. diam.

The affinity of *L. conoidea* appears to be with *L. Cervantesii* (H.B.K.) Kosterm. The large cone-like elongated thick pedicels and cupules are distinctive.

Nectandra capituliforma Lundell, sp. nov. — Arbor, ramis et ramulis dense ferrugineo-tomentosis; folia alternata, tomentosa, chartacea, petiolata, petiolo crasso, 5–8 mm. longo; lamina lanceolata, anguste elliptica vel oblanceolato-elliptica, 7–11 cm. longa, 2.5–4.5 cm. lata, apice acuta vel acuminata, basi rotundata vel late obtusa, nervis 4–6-paribus supra subimpressis subtus elevatis; inflorescentia axillaris, capituliformo-paniculata, tomentosa, longe pedunculata; pedicelli ad 2 mm. longi; stamina ser. I & II ovata, ca. 1.8 mm. longa; stamina ser. III biglandulosa; staminodia stipitata; ovarium glabrum.

Tree, 13–20 m. high, 15–36 cm. diam.; branches and branchlets rather thick, densely velutinous-tomentose with dark brown to ferruginous hairs; leaves alternate, sometimes clustered at apex of branchlets, at first

tomentose on both surfaces with soft fine hairs, chartaceous, petiolate; petioles thick, velutinous-tomentose, mostly 5–8 mm. long; leaf blades tawny, lanceolate, narrowly elliptic or oblanceolate-elliptic, 7–11 cm. long, 2.5–4.5 cm. wide, rounded or broadly obtuse at base, apex acute or acuminate, the veins slightly impressed above with the pubescence persistent along midvein and primary veins, the primary veins 4–6, arcuately ascending, prominent beneath like the midvein; inflorescences slender, axillary or subterminal, tomentose, compactly paniculate, up to 8 cm. long, with short branches, the peduncles elongated, the flowers pubescent, subracemose-capituliform, sometimes subcapitate, the pedicels short, up to 2 mm. long; perianth lobes spreading at anthesis, rather thin, oblong, 2.5–3 mm. long, rounded, cucullate; stamens of two outer series about 1.8 mm. long, pilose at base of short distinct filament, the anthers ovate or subrectangular, with distinct area of connective above arcuate cells, subpetaloid; stamens of inner series with truncate subrectangular anthers, with large fleshy glands longer than filaments; staminodia slender, stipitiform, pubescent, subtriangular apically; ovary glabrous.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, March 11, 1972, *Elias Contreras 11235* (LL, type), tree, 50 ft. high, 15 in. diam., flowers white; Union Barrios, in high forest, March 11, 1972, *Contreras 11233* (LL), tree, 60 ft. high, 15 in. diam.; Union Barrios, in high forest on top of hill, March 14, 1972, *Contreras 11318* (LL), tree, 40 ft. high, 6 in. diam., flowers white, aromatic, "*laurel.*"

The paniculate inflorescence with long peduncle and short branches, and flowers mostly subcapitate or subracemose-capituliform are distinctive. In leaf form and pubescence the species must resemble *N. Schippii* Allen, but differs in inflorescence and staminal features. The slender staminodia and subpetaloid anthers of outer series with apical connective are rather typical of *Nectandra*.

Nectandra longicuspis Lundell, sp. nov. — Arbor, ca. 16 m. alta, ramulis dense ferrugineo-tomentosis; folia petiolata, petiolo usque ad 5 mm. longo; lamina subchartacea, oblanceolata vel obovata, 10–22 cm. longa, 3–7.5 cm. lata, apice acuminata vel longicaudata, basi emarginata vel rotundata, costa supra impressa et pubescente, subtus elevata et tomentosa, nervis 9- vel 10-paribus supra impressis subtus elevatis et pubescentibus; inflorescentia axillaris, ad 8 cm. longa, tomentosa, paniculata, longipedunculata; flores 6–7 mm. diam., pedicellis pubescentibus, ad 2.5 mm. longis, perianthio glabro, lobis ca. 3 mm. longis, apice papillatis, basi intus pubescentibus; staminibus ser. I et II ovatis, ca. 0.8 mm. longis, ser. III biglandulosis, ca. 1 mm. longis; gynaecio glabro.

A tree, about 16 m. high, 20 cm. in diam., the branchlets densely ferruginous-tomentose with rather long often nearly straight hairs; leaves petiolate, the petioles short, thick, tomentose like the branchlets, up to 5 mm. long; leaf blades subchartaceous, oblanceolate or obovate, 10–22 cm. long, 3–7.5 cm. wide, apex subabruptly acuminate or caudate-acuminate, the narrow cusp up to 3 cm. long, base rounded and usually emarginate, pubescent beneath with soft hairs, at first pubescent above, at length

glabrous except along the midvein, the costa and primary nerve impressed above, elevated beneath, the primary lateral nerves 9 or 10 pairs; inflorescences axillary, paniculate, usually 5–8 cm. long, with peduncles 3–4 cm. long, sometimes shorter, pubescent with rather soft hairs; bractlets linear, pubescent; pedicels pubescent, short, about 2.5 mm. long; buds glabrous; flowers 6–7 mm. in diam., the spreading oblanceolate-elliptic lobes free nearly to base, about 3 mm. long, papillose apically, pubescent within at base, apex rounded or obtuse; anthers of two outer series about 0.8 mm. long, ovate, with connective well developed apically, the 4 cells arcuate, small, the filaments about 0.4 mm. long, pubescent at base; anthers of inner series fully 1 mm. long, subrectangular, the small glands equalling the short thick pubescent filaments; staminodia, when present, small, triangular; gynaecium glabrous, the thick style subequalling the ovary.

Guatemala: Dept. Izabal, El Estor, in high forest, March 7, 1972, *Elias Contreras 11186* (LL, type), tree, 40 ft. high, 8 in. diam., flowers yellowish.

Although resembling *Phoebe helicterifolia* (Meissner) Mez, the species appears to be referable to *Nectandra* with affinity to *N. belizensis* (Lundell) Allen. The oblanceolate cuspidate leaves rounded and emarginate at base, small flowers with short pubescent pedicels, and densely pubescent receptacle are features of *N. longicuspis* which appear to distinguish it. The linear bractlets of the inflorescence persist through anthesis.

N. Schippii Allen, known to me only from description, may be of this relationship. It has elliptic leaves.

Ocotea chrysobalanoides (Lundell) Lundell, comb. nov. *Persea chrysobalanoides* Lundell, Wrightia 1: 151. 1946.

Ocotea eucymosa Lundell, sp. nov. – Arbor, ramulis glabris; folia alternata, glabra, petiolata, petiolo 4–7 mm. longo, canaliculato; lamina chartacea, subtus reticulata, lanceolata vel anguste elliptica, 9–13 cm. longa, 3–4 cm. lata, basi subcuneata, apice acuminata vel caudato-acuminata, nervis 5–7-paribus; inflorescentia axillaris vel subterminalis, laxe cymoso-paniculata, ad 14 cm. longa, glabra; flores glabri, ad 2.5 mm. longi, pedicellis 2–5.5 mm. longis, gracilibus, perianthio subcampanulato, lobis crassis, ovatis, 1.2–1.7 mm. longis; staminibus ser. I & II ca. 1.5 mm. longis, antheris anguste oblongo-quadratis, ser. III ca. 1.7 mm. longis, filamentis biglandulosis; staminodia parva, stipitiforma; ovarium glabrum.

Tree, about 13 m. high, 20 cm. in diam., glabrous; branchlets slender, drying blackish; buds glabrous, but young leaves with ciliolate margins; leaves alternate, glabrous, chartaceous, the younger drying blackish, petiolate, the petioles slender, canaliculate, 4–7 mm. long; leaf blades lanceolate or narrowly elliptic, 9–13 cm. long, mostly 3–4 cm. wide, base subcuneate and slightly decurrent, apex acuminate or caudate-acuminate, glabrous, domatia conspicuous on lower surface, primary lateral veins

5–7 pairs, slender but elevated and conspicuous beneath, the upper surface nearly smooth with veins rather obscure, the lower surface with conspicuous reticulation, the midvein elevated beneath, less evident above; inflorescence glabrous, axillary and subterminal, subequalling leaves, cymose-paniculate, slender, with peduncle up to 6 cm. long, openly branched and lax, drying black; pedicel of terminal flower in cyme up to 5.5 mm. long, pedicels of flowers of branches of cyme only 2–3 mm. long; flowers small, glabrous externally, with rather shallow perianth tube about 1 mm. long, not constricted, the lobes thickish, ovate, 1.2–1.7 mm. long, nearly erect at anthesis; stamens of two outer series about 1.5 mm. long, the small oblong-rectangular anthers only slightly longer than the thick filaments, the inner series of stamens up to 1.7 mm. long, similar, with two sessile glands at base, the glands shorter than filaments, the staminodia slender, stamens and staminodia finely pubescent at base; ovary glabrous, the style tapering, the stigma punctiform.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, March 10, 1972, *Elias Contreras 11215* (LL, ✓type), tree, 40 ft. high, 8 in. diam., flowers yellow-green, "*laurel.*"

Although of possible affinity to *O. cernua* (Nees) Mez, the cymose inflorescence raises doubts as to this relationship. The small glabrous flowers with narrow anthers subequalling filaments and the punctiform stigma are notable. The dull and nearly smooth upper leaf surface contrasts markedly with the reticulate venation beneath.

Ocotea viridiflora Lundell, sp. nov. — Arbor parva, glabra, ramulis gracilibus; folia alternata, parva, glabra, petiolata, petiolo 5–7 mm. longo, canaliculato; lamina membranacea, lanceolata, 5–8.5 cm. longa, 2–2.4 cm. lata, basi revoluta, acuta, apice caudato-acuminata, subtus reticulata; inflorescentia axillaris, pauciflora, racemosa, ca. 3.5 cm. longa, glabra; pedicelli ad 7 mm. longi; flores ad 3 mm. longi, lobis ovatis, 2.5 mm. longis, glabris; stamina ser. I & II ca. 2 mm. longa; ser. III basi biglandulosa; ser. IV staminodia stipitata, strigulosa; ovarium glabrum.

Small tree, glabrous, the branchlets slender, drying blackish; leaves small, alternate, membranaceous, petiolate, the petioles slender, canaliculate, (4) 5–7 (8) mm. long, drying blackish; leaf blades white-ciliate in bud, entirely glabrous otherwise, lanceolate, 5–8.5 cm. long, 2–2.4 cm. wide, revolute and decurrent at base, acute, the apex caudate-acuminate, the slender acumen obtusish, finely but conspicuously reticulate beneath, shining and more openly reticulate above, the costa nearly plane above, elevated beneath, the primary lateral veins 6 or 7 pairs, very slender, elevated beneath; inflorescences axillary, few-flowered, racemose, about 3.5 cm. long, glabrous, drying blackish, up to 7 mm. long; flowers greenish, drying blackish, glabrous outside, the perianth lobes patent, thin, glabrous, ovate, 2.5 mm. long, equal, the obtuse apex obscurely ciliolate; stamens of ser. I & II scarcely 2 mm. long, the anthers 4-celled, ovate, emarginate, equalling the slender filaments; ser. III with two large subsessile glands at base, the filaments strigulose, the anthers 4-celled, emarginate; staminodia of ser. IV very slender, stipe-like and

strigulose when present; ovary ovoid, glabrous, the style slender, 1 mm. long, shorter than ovary, the stigma discoid, conspicuous.

Panama: Chiriqui, on trail to Cerro Horqueta, in cloud forest, alt. 6000-6500 ft., May 15, 1971, *George R. Proctor 31916* (LL, type), small tree, mostly sterile; flowers greenish, fragrant.

Apparently related to *O. Klotzschiana* (Nees) Hemsley of Mexico, *O. viridiflora* differs in having glabrous short petioled leaves without axillary glands, glabrous flowers on pedicels up to 7 mm. long, and anthers subequalling filaments.

Persea guatemalensis Lundell, sp. nov. – Arbor ad 23 m. alta; ramuli angulares, striati, ad apicem albo-strigulosi; folia parva, chartacea, petiolata, petiolo canaliculato, 1.5–2.5 cm. longo; lamina lanceolata, elliptica vel obovato-elliptica, 7–12 cm. longa, 3–5 (6.5) cm. lata, basi revoluta, acutiuscula, apice acuta vel apiculato-acuminata, novella utrinque subsericea, supra glabrata, utrinque areolata, subtus glauca, costa supra impressa, venis primariis 5–7-jugis; inflorescentiae longe pedunculatae, axillares et subterminales, cymoso-paniculatae; pedicelli ad 1 mm. longi; flores dense albo-strigulosi; perianthii segmenta exteriora late ovata, 3.5–4 mm. longa, ca. 3.2 mm. lata, utrinque dense albo-strigulosa; perianthii segmenta interiora subaequalia, utrinque dense albo-strigulosa; ser. I, II & III filamenta pubescentia; ser. IV staminodia sagittata, pubescentia; gynoecium puberulum.

Tree, about 23 m. high, 45 cm. in diam.; branchlets drying black, angled and striate, minutely and finely strigulose like the petioles and inflorescence; leaves mostly small, chartaceous, petiolate, the petioles 1.5–2.5 cm. long, slender, canaliculate, drying black; leaf blades lanceolate, elliptic or obovate-elliptic, 7–12 cm. long, 3–5 (6.5) cm. wide, base revolute, acutish, apex acute or apiculate-acuminate, subsericeous at first, glabrous early above, areolate on both surfaces, glaucous beneath, costa impressed above, elevated beneath, the primary veins 5–7 pairs, very slender, not conspicuous on either surface, arcuately ascending; inflorescences subterminal and axillary, up to 16 cm. long, the peduncles up to 11 cm. long, the panicles cymose-like, white strigulose; flowers subsessile, white strigulose-tomentellous, the outer perianth segments broadly ovate, 3.5–4 mm. long, about 3.2 mm. wide, about equalling the inner, pubescent on both surfaces like the inner, the inner perianth segments acutish; filaments of stamens of ser. I & II about 1.6 mm. long, stout, pubescent, the anthers slightly shorter, glabrous above; filaments of stamens of ser. III stout, pubescent, the small glands subsessile, subbasal, the anthers quadrilocular, equalling filaments, glabrous; staminodia of ser. IV sagittate, strigulose dorsally; gynoecium pubescent, the ovary tapering into the slender puberulent style 2 mm. long; stigma capitate.

Guatemala: Dept. Baja Verapaz, Chilasco, Tierra Caliente, 15 km., in high forest on rocky hill, Aug. 3, 1971, *Elias Contreras 10943* (LL, type) tree, 70 ft. high, 18 in. diam., flowers greenish, "*aguacatillo de montana.*"

P. guatemalensis has affinity to *P. rigens* Allen, *P. pallida* Mez & Pittier, and *P. cinerascens* Blake, all of which have much larger leaves and gynoecium glabrous.

Persea rufescens Lundell, sp. nov. — Arbor, 5–6 m. alta, ramulis atro-rubescentibus glabrescentibus, apice foliosis; folia glabra, subverticillata, petiolis rubescentibus 1.5–2.5 cm. longis; lamina coriacea, lanceolata vel oblongo-lanceolata, ad 21 cm. longa, 6 cm. lata, apice attenuato-subacuminata, costa utrinque elevata, nervis 10–11-paribus; inflorescentia paniculata, ad 15 cm. longa, minute tomentella; pedicelli fructiferi crassi, 2–3 mm. longi, tomentelli; flores brevipedicellati, perianthio minute tomentello, lobis ovatis pubescentibus exterioribus 2 mm. longis et latis, interioribus 2.3 mm. longis; staminibus ser. I & II 2.5 mm. longis, antheris oblongis, quam filamentis pubescentibus duplo longioribus, ser. III 3 mm. longis, filamentis pubescentibus aequalibus biglandulosis; staminodiis ser. IV 1.8 mm.; fructus globosus, ad 1.8 cm. diam.

Tree, 5–6 m. high; branches subterete, stout, lenticellate, drying reddish, glabrate; branchlets rather slender, striate, glabrate; leaves glabrous, crowded at apex of branchlets, the apical internodes very short, the petioles rather rigid, some slender, canaliculate, mostly 1.5–2.5 cm. long; leaf blades thickly coriaceous, shining above, drying reddish-brown, slightly paler beneath, lanceolate or oblong-lanceolate, 11–21 cm. long, 3–6 cm. wide, apex tapering into broad acumen, the acumen obtusish, base acute, decurrent, very obscurely areolate on both surfaces, the costa broad, reddish and rounded above, similar beneath but broader and more conspicuous, the slender primary veins 10 or 11 pairs, equally visible on both surfaces but inconspicuous; inflorescences subterminal and axillary, narrowly paniculate, up to 15 cm. long, the lower branches of panicle falling early giving a long-peduncled appearance, the panicles finely tomentellous, glabrate below; pedicels of fruits thick, 2–3 mm. long, lenticellate, finely tomentellous; flowers finely tomentellous, the perianth lobes pubescent on both surfaces, the outer rather sparsely, subequal, rigid, ovate, 2–2.3 mm. long, fully 2 mm. wide; stamens of ser. I & II 2.5 mm. long, the 4-celled anthers subequalling the stout pubescent filaments; stamens of ser. III 3 mm. long, the filaments pubescent, only slightly longer than anthers, the two glands subsessile, attached above base of filament about one-third; staminodia of ser. IV 1.8 mm. long, sagittate, the filament pubescent; perianth patent, persistent; fruits globose, drying up to 1.8 cm. in diam., shiny.

Mexico: Chiapas, in virgin forest, Boqueron, near Motozintla, alt. 2540 m., May 4, 1945, *Eizi Matuda 5394* (LL, type), tree, 15–18 m. high.

The flowers are described from dried remains in the inflorescence. *P. rufescens* appears to be related to *P. Standleyi* Allen, differing notably in leaf characteristics.

SAXIFRAGACEAE

Phyllonoma cacuminis Standl. & Steyerm., Field Mus. Bot. 22: 334. 1940.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest, 6 km. east, on Concepcion Road, July 27, 1971, *Elias Contreras 10900* (LL), small tree, 25 ft. high, 5 in. diam., flowers greenish.

Fine material is available now from Baja Verapaz, and *P. cacuminis* is a remarkably distinct species. Notably, the inflorescence consists of fascicles of 4–6 slender few-flowered lax cymes up to 1.8 cm. long with peduncles two-thirds the length of cymes. The thin minutely serrulate leaves further distinguish it. Through the courtesy of Dr. Lorin I. Nevling, Jr., I have examined the type (F), the only collection heretofore of the tree.

Two collections of *P. laticuspis* (Turcz.) Engler, *Contreras 4995* (LL), *5001* (LL), both from Cerro de La Cruz near Nebaj in the Department of El Quiche, extend the range of that species in Guatemala.

ROSACEAE

Licania guatemalensis Lundell, sp. nov. – Arbor, ca. 30 m. alta, 1 m. diam., ramulis glabris; folia alterna, glabra, petiolata, petiolo usque ad 5 mm. longo; lamina chartacea, basi glandulosa, late elliptica, 10–21 cm. longa, 5.5–9.5 cm. lata, apice subabrupte acuminata, basi rotundata et acutiuscula, utrinque reticulata, venis 8–10-jugis; inflorescentia terminalis, cymoso-paniculata, usque ad 13 cm. longa, multiflora, minute tomentosa; pedicelli ad 1 mm. longi; calycis tubus campanulatus, ca. 2 mm. longus, minute tomentosus; sepala ca. 1 mm. longa, acuta; petala parva, albo-tomentosa, ea. 1.2 mm. longa; stamina 14 vel 15, glabra; filamenta 1.5–1.8 mm. longa; ovarium tomentosum; stylus ca. 4 mm. longus.

Tree, about 30 m. high, 1 m. in diam., the branchlets slender, brown, subterete, glabrous; the stipules triangular, about 1.2 mm. long; leaves alternate, glabrous, subsessile, the thick petioles usually less than 5 mm. long, broadly canaliculate; leaf blades chartaceous, with glands at base, broadly elliptic, 10–21 cm. long, 5.5–9.5 cm. wide, apex subabruptly short acuminate, base rounded and acutish, reticulate veined on both surfaces, the midvein nearly plane above, prominent and elevated beneath, primary lateral veins 8 to 10 pairs, rather slender but conspicuous on both surfaces; inflorescence terminal, cymose-paniculate, up to 13 cm. long, whitish-tomentulose, the tomentum minute; flowers tomentose, short pedicellate, the pedicels up to 1 mm. long; hypanthium and calyx 2.8–3 mm. long, the hypanthium campanulate; sepals small, ovate-triangular, up to 1 mm. long, acute, reflexed at apex; petals white-tomentose, very small, short stalked, suborbicular or elliptic-obovate, about 1.2 mm. long, fugacious; stamens 14 or 15, borne at apex of hypanthium; filaments glabrous, slender, 1.5–1.8 mm. long, united at base; anthers small; ovary free at base of hypanthium, tomentose; style basilar, slender, about 4 mm. long; stigma small, capitate-punctiform.

Guatemala: Dept. Izabal, in high forest, between Seja and Fronteras on Peten-Guatemala Road, May 6, 1971, *Elias Contreras 10742* (LL, type), tree, 90 ft. high, 36 in. diam., flowers greenish-white.

Probably related to *L. platypus* (Hemsl.) Fritsch, but distinct in having mostly subsessile broadly elliptic leaves, smaller sepals, tomentose petals scarcely half as large, fewer stamens, and a tomentose ovary.

Licania mexicana Lundell, sp. nov. — Arbor parva; ramuli novelli adpresse floccoso-tomentosi; folia alterna, novella utrinque adpresse floccosa, glabrata, petiolata, petiolo 1.5–4 mm. longo, incrassato, ruguloso; lamina coriacea, utrinque reticulato-venosa, lanceolata vel anguste oblongo-elliptica, 6.5–13 cm. longa, 2.5–4.5 cm. lata, apice acuta, attenuata, basi acuta; inflorescentia terminalis, anguste paniculata, 2–3.5 cm. longa, pauciflora, minute floccosa et tomentosa; pedicelli ad 1 mm. longi; calycis tubus campanulatus, ca. 3 mm. longus, intus adpresse pilosus; sepala ca. 1 mm. longa, acuta; stamina 14 vel 15; filamenta libera ca. 1.5 mm. longa, glabra; ovarium glabrum; stylus 4 mm. longus.

Tree, up to 10 m. high, 15 cm. in diam., the branchlets slender, rigid, subterete, finely floccose at first with appressed tomentum, glabrous early; stipules narrowly triangular, rigid, up to 2 mm. long, acicular; leaves alternate, finely appressed floccose on all surfaces at first, glabrous early, coriaceous, short petiolate, the petioles 1.5–4 mm. long, thickened and rugose; leaf blades lanceolate or narrowly oblong-elliptic, 6.5–13 cm. long, 2.5–4.5 cm. wide, apex acute, attenuate, base acute, slightly decurrent, conspicuously but finely reticulate-veined on both surfaces, the primary lateral veins 6–8 pairs, slender, the midvein rounded and elevated on both surfaces; inflorescence terminal, very narrowly paniculate, 2–3.5 cm. long, the primary branches only 1–3 mm. long, finely floccose and minutely tomentose; pedicels short, up to 1 mm. long; the hypanthium and calyx finely floccose and minutely tomentose; the hypanthium campanulate, about 3 mm. long, pilose within with appressed hairs; sepals triangular, about 1 mm. long, attenuate, acute, reflexed at anthesis; no petals found; stamens 14 or 15; filaments equal, glabrous, about 1.5 mm. long, united at base into distinct tube; anthers small; ovary essentially glabrous, the hairs few and scattered; style basilar, slender, glabrous, 4 mm. long.

Mexico: Sinaloa, along arroyo, between Rancho Del Pino and Chele, May 11, 1943, *C. L. Lundell 13023* (LL, type), tree, 6 in. diam., 30 ft. high.

L. mexicana has affinity to *L. retifolia* Blake, a species described as having glabrous branchlets and leaves, longer petioles, a pyramidal inflorescence with numerous flowers, a smaller hypanthium, and longer filaments. The small narrow panicles and floccose indument, as well as subsessile larger leaves, are distinctive features of *L. mexicana*.

GUTTIFERAE

Clusia uniflora Lundell, sp. nov. — Arbor parva, glabra, ramulis crassis; folia coriacea, petiolata, petiolo crasso, canaliculato, 3–4 mm. diam., ad 2 cm. longo; lamina oblanceolata vel oblanceolato-elliptica, 9–15 cm. longa, 4.5–6.5 cm. lata, apice late rotundata, basi late cuneata; inflorescentia uniflora, breviter pedunculata, pedunculo crasso, 3–8 mm. longo; bracteae crassae, carinatae, late ovatae, ad 8 mm. longae; sepala crassa, late ovata, ad 1.5 cm. longa, 2 cm. lata, rotundata; capsula 1, subglobosa, sulcata, ca. 15-locularis.

Small tree, glabrous, the branches thick; leaves decussately opposite, rather crowded at apex of branchlets, distinctly petiolate, the petioles thick, canaliculate, 3–4 mm. in diam., up to 2 cm. long; leaf blades drying rigidly coriaceous, oblanceolate or oblanceolate-elliptic, 9–15 cm. long, 4.5–6.5 cm. wide, apex rounded, base broadly cuneate, decurrent on petiole, the midvein elevated and prominent beneath, nearly plane above, the very slender veins numerous, ascending at a very wide angle, evident but inconspicuous on both surfaces; fruits solitary at apex of branchlets, subsessile, the thick peduncle 3–8 mm. long, usually thicker than long, the conspicuous bracts coriaceous, broadly ovate, up to 8 mm. long, carinate, acute; sepals coriaceous, depressed ovate-orbicular, up to 1.5 cm. long, 2 cm. wide, broadly rounded, the inner largest; fruit depressed-globose, the immature up to 2.5 cm. long, 3 cm. wide, about 15-celled, deeply ribbed with flattened stigma borne on each rib up to 1 cm. from apex of fruit, the fruits deeply sulcate to apex between stigmas; stigmas large, thick, flattened, ovate, tapering to apex, forming ring up to 2 cm. in diam.

Guatemala: Dept. Peten, La Cumbre, east of km. 140 of Cadenas Road, in high forest on top of rocky hill, July 28, 1969, *Elias Contreras 8869* (LL, type), small tree, 25 ft. high, 5 in. diam., with yellow latex.

With its solitary terminal nearly sessile fruits, peculiar fruits usually 15-celled and with 15 ribs deeply sulcate to apex, and with ring of large flat stigmas up to 2 cm. in diameter, *C. uniflora* is unlike any other of the region. The leaves resemble those of *C. Pringlei* Lundell.

FLACOURTIACEAE

Casearia belizensis Standl., Field Mus. Bot. 12: 412. 1936; Fieldiana: Bot. 24(7): 90. 1961.

Guatemala: Dept. Izabal, Puerto Mendez, km. 9 on Toquela Road, in high forest, June 12, 1970, *Elias Contreras 10027* (LL), *10030* (LL), tree, 40-60 ft. high, 6–15 in. diam.; km. 10 on Toquela Road, in high forest, June 12, 1970, *Contreras 10036* (LL), tree, 90 ft. high, 18 in. diam.; km. 26 on Rio Dulce Road, Cienaga, in high forest, Sept. 20, 1970, *Contreras 10316* (LL), *10319* (LL), *10328* (LL), tree, 35-60 ft. high, up to 15 in. diam., flowers white; km. 28 on Rio Dulce Road, bordering Rio Sehila, Sept. 21, 1970, *Contreras 10322* (LL), *10324* (LL), *10326* (LL), tree, 55–75 ft. high, 12–15 in. diam.

The small fruits of *C. belizensis* are deeply sulcate with three rounded lobes. This clearly separates the species from *C. javitensis* H.B.K. var. *myriantha* (Turcz.) L. Wms. which does not appear to be even related. William (loc. cit.) considered *C. belizensis* a possible pubescent phase of *C. javitensis*.

Casearia Guidonia (Swartz) Lundell, comb. nov. *Laetia Guidonia* Swartz, Prodr. Veg. Ind. Occ. 83. 1788; *Zuelania Guidonia* (Swartz) Britton & Millsp., Bahama Fl. 295. 1920.

In the fine material available, represented by *Elias Contreras 8449* (LL) from Dos Lagunas, Dept. of Peten, Guatemala, the style is quite

thick but distinct. If *Casearia spiralis* J. R. Johnston (*Zuelania belizensis* Lundell), with its numerous stamens and short thick style, is to be kept in *Casearia*, then the transfer of this species is in order.

Casearia tacanensis Lundell, Lloydia 4: 54. 1941; Fieldiana: Bot. 24 (7): 93. 1961.

Mexico: Chiapas, Volcan de Tacana, alt. 1000–2000 m., Aug. 1938, *Eizi Matuda 2441* (MICH, type); Santa Rosa, near Escuintla, alt. 1600 m., in virgin forest, June 20, 1941, *Matuda 4245* (LL), tree, 10 m. high; Mt. Ovando, near Escuintla, Nov. 14, 1945, *Matuda 6151* (LL).

Guatemala: Dept. Alta Verapaz, Sebol, in high forest, ca. 2 km. east of the village, May 2, 1964, *Elias Contreras 4578* (LL), small tree, 5 in. diam., 25 ft. high. Dept. Peten, Seamay, bordering Arroyo Seamay, Mar. 5, 1967, *Contreras 6650* (LL), tree, 60 ft. high, 8 in. diam., flowers greenish and aromatic; La Cumbre, km. 145 of Cadenas Road, May 15, 1971, *Contreras 6917* (LL), tree, 40 ft. high, 8 in. diam. Dept. Izabal, Puerto Mendez, on Rio Dulce Road, km. 15, in low forest, May 20, 1970, *Contreras 9858* (LL), small tree, 15 ft. high, 3 in. diam.; between Seja and Fronteras, on Peten-Guatemala Road, in high forest, May 8, 1971, *Contreras 10752* (LL), tree, 45 ft. high, 10 in. diam.; same locality, *Contreras 10574* (LL), tree, 50 ft. high, 8 in. diam.

That this distinctive rain forest tree remained uncollected until 1938 and undescribed until 1941, in spite of activities in this region by some of the most voracious collectors of the century, points up again the limited extent of our knowledge of the flora of the tropical forests of North America.

The Guatemalan collections are less pubescent than those of Chiapas, and show considerable variation. The pale tomentose fruits, usually tuberculate, well mark the species.

MYRTACEAE

Calyptranthes mammosa Lundell, sp. nov. — Frutex omnino glaber, ramulis novellis bicarinatis; folia breviter petiolata, petiolo crasso, 2.5–3.5 mm. longo; lamina parva, coriacea, lanceolato-oblonga vel oblanceolata, 2–4.5 cm. longa, usque ad 1.5 cm. lata, apice obtusa, basi acutiuscula; inflorescentiae numerosae axillares et ad apices ramorum fasciculatae foliis breviores, 3-florae, raro 1- vel 5-florae, 1.5–3 cm. longe pedunculatae; pedicelli 0.5–2 mm. longi; calyx in alabastro ellipsoideus, apice mammosus; fructus subglobosus.

A shrub up to 6 meters high, entirely glabrous even in early growth stages except for reddish hairs on the vegetative buds; branchlets slender, obscurely bicarinate below the apical nodes; leaves coriaceous, paler beneath, lanceolate-oblong or oblanceolate, 2–4.5 cm. long, up to 1.5 cm. wide, narrowed to the obtuse apex, base acutish, the midvein plane or elevated above, when elevated a medial groove sometimes present at base, the midvein elevated beneath, the primary veins very slender, often obscure above, the glands very small and inconspicuous on both surfaces; petioles drying darker than blade, shallowly canaliculate, rather rugose,

stout, 2.5–3.5 mm. long; inflorescences axillary, fasciculate, rigid, shorter than the leaves, 1.5–3 cm. long in flower, 3-flowered, very rarely 1- or 5-flowered, entirely glabrous, the flower buds with short pedicels 0.5–2 mm. long, pedicels accrescent, longer in fruit; flower buds ellipsoid or obovoid, mammose apically, glabrous; fruits subglobose, about 7 mm. in diam. when dry, crowned by collar about 1.3 mm. high, 3 mm. in diam.

Guatemala: Dept. Peten, La Cumbre, Chacalte Arriba, km. 155 of Cadenas Road, in high forest on riverbank, Feb. 20, 1971, *Elias Contreras 10572* (LL, type), shrub, 15 ft. high, 3 in. diam., fruit dark red, "*guayabillo*." Also, *Contreras 10562* and *10566* from same locality collected on Feb. 19, 1971.

C. mammosa is related to *C. hondurensis* Standl., but differs from this and species of this affinity in its predominantly 3-flowered short rigid inflorescences often fasciculate in the leaf axils. The small leaves of *C. mammosa* are lanceolate-oblong to oblanceolate, with midvein elevated to nearly plane above, rarely somewhat sulcate near the base. In flower the buds are short-pedicellate, the pedicels accrescent and longer in fruit.

Like *C. Aguilarii* Standl. & Steyerm., the shrub is entirely glabrous except for the vegetative buds. After a study of the types of *C. Aguilarii* and *C. belizensis* (Standl.) Lundell, I can not agree with McVaugh [Fieldiana: Bot. 24(7): 299. 1963] in his disposition of these species as synonyms of *C. hondurensis*.

Eugenia eustipitata Lundell, sp. nov. – Arbor, ramulis glabris; folia glabra, petiolata, petiolo 7–11 mm. longo; lamina coriacea, lanceolato-oblonga vel anguste elliptico-oblonga, 7.5–10.5 cm. longa, 2–3.5 cm. lata, apice subacuminata, obtusa, basi acutiuscula, costa supra impressa; inflorescentia axillaris, tomentosa, racemosa, usque ad 4 mm. longa; pedicelli 3.5–6 mm. longi; bracteolae late rotundatae, ca. 0.4 mm. longae; fructus stipitatus, tomentosus, subglobosus, usque ad 1.5 cm. diam.; sepala ovato-elliptica, ca. 3 mm. lata, 3.5 mm. longa, tomentosa; discus ca. 3 mm. diam.

A tree, about 16 meters high, 25 cm. in diam., branchlets glabrous, compressed at first, vegetative buds pubescent with short hairs; leaves entirely glabrous, petiolate, the petioles canaliculate, 7–11 mm. long; leaf blades coriaceous, green above, drying brownish on lower surface, lanceolate-oblong or narrowly elliptic-oblong, 7.5–10.5 cm. long, 2–3.5 cm. wide, apex subacuminate and obtuse or obtuse, base acutish and decurrent, costa elevated beneath, impressed above the entire length of blade, primary veins very slender and rather obscure on both surfaces, 17–22 pairs; inflorescences axillary, short racemose, the axis scarcely evident or up to 4 mm. long, tomentose with fine hairs; pedicels of fruits rigid, tomentose, 3.5–6 mm. long; bracteoles very short, ca. 0.4 mm. long, broadly rounded, free; fruits finely tomentose, conspicuously stipitate, the stipes 2–3 mm. long, subglobose, up to 1.5 cm. in diam.; sepals ovate-elliptic, rounded at apex, up to 3 mm. wide, 3.5 mm. long, subequal, finely pubescent on both surfaces; disk in fruit fully 3 mm. in diam.

Guatemala: Dept. Izabal, Puerto Mendez, on Rio Dulce Road, 9 km., in *zapotal*, Jan. 10, 1970, *Elias Contreras 9991* (LL, type), tree, 50 ft. high, 10 in. diam., "*guayabillo.*"

Of probable affinity to *E. toledinensis* Lundell, *E. eustipitata* differs in its glabrous leaves and branchlets, costa of leaves deeply impressed above, more numerous and less evident lateral veins, pedicels longer, and fruits conspicuously stipitate.

Myrciaria mexicana Lundell, sp. nov. — Frutex, ramulis minute puberulis; folia petiolata, petiolo minute puberulo, 3.5–6 mm. longo; lamina subchartacea, pellucido-punctata, lanceolata, 4–6.5 cm. longa, 1.2–2.3 cm. lata, basi acuta, apice acuminata, cuspidata, costa supra minute puberula; flores subsessiles; bracteolae parvae; fructus globosus, usque ad 1.4 cm. diam.

An arborescent shrub 4 m. high, the branchlets slender, densely puberulent with minute antrorse hairs; leaves small, thin, subchartaceous, petiolate, the petioles very slender, 3.5–6 mm. long, puberulent with antrorse hairs, shallowly canaliculate; leaf blades dark green, concolorous, pellucid-punctate, lanceolate, widest at or near the middle, 4–6.5 cm. long, 1.2–2.3 cm. wide, base acute, apex acuminate, cuspidate, midvein elevated on both surfaces, puberulent above, glabrous or nearly so beneath, the blade glabrous, veins numerous, slender, rather obscure; fruit subsessile in leaf axils, the bracteoles small, less than 1 mm. long; fruit globose, drying 1.4 cm. in diam., with elevated conspicuous glands, glabrous.

Mexico: Veracruz, Tepezingo, Municipio de Huatusco, alt. 1245 m., January 20, 1972, *F. Ventura A. 4796* (LL, type), arbusto de 4 m. de alto; fruto morado, tiene hueso; tallo liso; abundante.

In appearance *M. mexicana* looks much like *M. Ibarrae* Lundell, a species of the lowlands of Peten, Guatemala. It differs markedly in having leaves acute at base, and in its pubescence of very minute antrorse hairs. *M. Ibarrae* has leaves mostly rounded at base and it is uniformly hispidulous-pubescent with rather coarse bristle-like erect or antrorsely crisped hairs up to 0.5 mm. long.

MYRSINACEAE

Gentlea mexicana (Lundell) Lundell, comb, nov. *Ardisia mexicana* Lundell, Wrightia 3: 77. 1963.

G. mexicana resembles *G. McVaughii* (Lundell) Lundell, also of Jalisco, but may be recognized at once by its slender longer merely canaliculate petioles. In *G. McVaughii* the leaf blade is decurrent and the petiole is conspicuously marginate to base.

TAXONOMY OF LOXOTHYSANUS (COMPOSITAE, HELENIEAE)

B. L. Turner[1]

Abstract

Turner, B. L. (Department of Botany, The University of Texas, Austin 78712). *Loxothysanus* is composed of only two closely related species, both endemic to the subtropical, mid-elevation, mountainous regions of eastern Mexico. It is perhaps most closely related to the genera *Hymenothrix* and *Florestina* of the subtribe Bahiinae.

Loxothysanus is a genus of only two species both of which usually occur on rocky, limestone outcrops of eastern Mexico, mostly in barancas at elevations of 300 to 2000 meters. The type species, *L. sinuatus*, was originally described as belonging to the genus *Bahia* by Lessing. He was followed in this by A. Gray (1861), who commented: "Technically this might well enough be taken as the type of a new genus; but if it had rays it would certainly be referred to *Bahia* proper, of which it has the habit and whole general structure. The white, or possibly flesh-colored flowers, with a glandular tube, &c., show an affinity to *Florestina;* — but the opposite leaves, and the capitellate tips of the branches of the style (which accord with *Bahia* § *Eriophyllum*) are quite different. The extraordinary reduction of the paleae of the pappus on the side toward the center of the receptacle is constant."

Subsequently Robinson (1907) erected the genus *Loxothysanus* to accommodate the above species and yet another newly described variant of that species, *L. filipes* (reduced to synonymy in the present treatment). The genus is named for the "extraordinary" nature of its pappus, first noted by Gray, which is derived from the Greek meaning "pappus abbreviated on one side".

The phyletic position of the genus is not known with any certainty. In the only comprehensive treatment of *Loxothysanus*, and related groups, Rydberg (1914) placed the genus in the subtribe Bahiinae next to *Picradeniópsis* and *Bahia*. Ellison (1964), who monographed the latter two genera, failed to see any close connection with *Loxothysanus*. Turner and Johnston (1961) and Turner (1962), suggested that *Loxothysanus*, because of its white corollas, rayless heads, opposite leaves, and habitat proclivity (i.e., a tendency to grow on rocky outcrops in mountainous regions, much in the manner of *Perityle*), might best be positioned in or near the subtribe Peritylinae. Superficially, at least, the genus is similar to other members of that subtribe. On closer examination, however, Powell and Turner (1974) did not feel that *Loxothysanus* was sufficiently close to *Perityle* and related genera to be included in that subtribe.

The base chromosome number ($x = 15$) of *Loxothysanus* (Turner and Johnston, 1961) is interesting in that it doesn't readily suggest a relationship with other, presumably related, taxa for which counts are available. *Bahia* itself is multibasic with $x = 8$, 10, 11, 12, and 18, while *Hymenothrix* has a base number of $x = 12$ (Turner, 1962). The Peritylinae have

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a wide range of base numbers ($x = 11$, 12, 13, 16, 17, 18, and 19), with $x = 15$ strangely absent, especially since Powell (1968) suggests that the lower base numbers were perhaps ultimately derived by descending aneuploidy from an ancestral base of $x = 17$ or 18.

Morphological comparisons, especially of floral features, suggest that *Loxothysanus* is most closely related to *Hymenothrix*. Both possess species with zygomorphic disc corollas, rayless white heads, four-sided, obpyramidal achenes with pappus scales, and similar style branches; but they differ vegetatively and chromosomally: *Hymenothrix* with alternate leaves and a base number of $x = 12$; *Loxothysanus* with opposite leaves and a base number of $x = 15$.

My current opinion is that *Loxothysanus* stands somewhere in the subtribe Bahiinae as constituted by Turner (1963), especially near *Florestina* and *Hymenothrix*. In this I revert to the position accorded the genus by Rydberg (1914), except that the latter made its position there seem unnatural in that he included its two closest relatives, *Florestina* and *Hymenothrix*, in the subtribe Hymenopappinae, a subtribe in which I would assign but the single genus *Hymenopappus*. But it should be noted that subtribes are only "technically" placed in the polyphyletic tribe Helenieae and it might be that on phyletic grounds the Bahiinae stand somewhere between the tribes Heliantheae (subtribe Galinsoginae) and the Senecioneae [subtribe Peritylinae, where Powell and Turner, (1974) are inclined to position this taxon]. The subtribe Heleniinae (or Gaillardinae), which includes *Helenium* and six or seven related genera, clearly should be placed within the Heliantheae, and the genera *Actinospermum* and *Balduina* appended to this (Bierner, 1971).

In summary, it is my opinion that *Loxothysanus* is an old relic group whose origin is not easily traced via extant relatives. However, on morphological grounds it might best be placed near the genera *Hymenothrix* and *Florestina* in the subtribe Bahiinae.

LOXOTHYSANUS B. L. Robinson

Perennial or annual herbs; leaves simple (rarely opposite above), opposite, petiolate, conspicuously reticulate veined and covered with minute oil droplets; arrangement of heads, corymbose; heads discoid, involucre campanulate to broadly turbinate, the involucral bracts densely minutely-glanduliferous, biseriate (often appearing uniseriate), oblanceolate to obovate; receptacle naked, flat; florets 50–70 per head, perfect and fertile; corolla white, zygomorphic, especially those at the periphery, the tube glandular-pubescent, about as long as the funneliform to campanulate throat; corolla lobes 5, unequal, the sinuses of varying depths; anthers 5, sagittate-auriculate at the base; style branches flattened, with a short obtuse, papillate appendage, the stigmatic lines marginal and extending to the apex; achenes linear-oblanceolate, 4-sided, pubescent with short, stout, flattened hairs, the angles callus-thickened; pappus squamellae 5–8, oblique, erose, the outer or centrifugal scales shorter than the inner.

Base chromosome number, $x = 15$.

Type species *Bahia sinuata* Less.

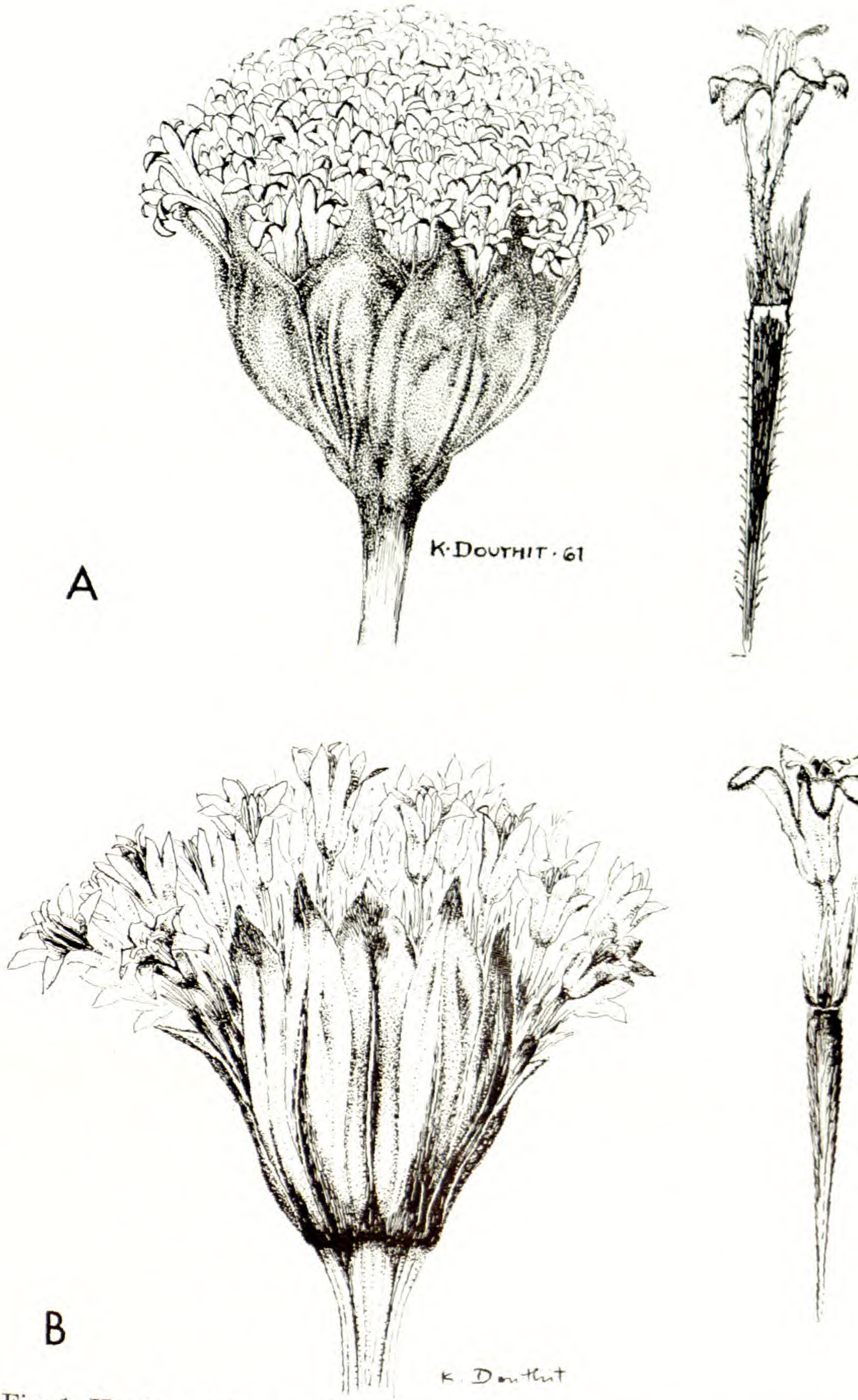

Fig. 1. Heads and florets of *Loxothysanus* species – A. *L. pedunculatus* (*King 4236*, TEX), head, × 7; floret × 10. B. *L. sinuatus* (*Johnston 4794*, TEX) head, × 9; floret × 10.

Key to Species

Leaves thin, moderately white-tomentose to merely puberulet beneath; arrangement of heads relatively open, the individual heads on peduncles 2–8 cm. long ..... 1. *L. pedunculatus*

Leaves thick, densely white-tomentose (velvety) beneath; arrangement of heads relatively congested, the individual heads on peduncles 0.5–2.5 cm. long ..... 2. *L. sinuatus*

1. **Loxothysanus pedunculatus** Rybd., N. Am. Fl. 34: 33. 1914. Holotype (NY). San Luis Potosi, "Bare Mountain ledges, Tamasopo Canyon," 24 Jun. 1890, *C. G. Pringle 3096*. Isotypes (F, GH, MICH, MO, UC, US).

Annual or perennial(?) herbs, the stems round, stiffly erect, brittle, often somewhat woody at the base; leaves 1.5–12.0 cm. long; blades thin, ovate to deltoid, sinuate, often 3-lobed, obtuse to truncate at the base, at first densely white-pubescent beneath but with age becoming only moderately puberulent; petioles mostly 1–5 cm. long; inflorescence a lax corymb, the heads on peduncles 2–8 cm. long; involucre broadly campanulate, 0.8–1.0 cm. wide, 0.6–0.8 cm. high; involucural bracts 14–16, oblanceolate to obovate, abruptly acute at the apex, densely granular-furfuraceous, 6–8 mm. long, 2–3 mm. wide; corolla ca. 3 mm. long, zygomorphic, the lobes 0.5–1.0 mm. long, of unequal lengths; achenes 3.5–4.0 mm. long, ca. 0.5 mm. wide, stipitate for ca. 1 mm. at the base; pappus oblique, the scales 0.5–2.0 mm. long.

Chromosome number, n = ca. 15 pairs.

Distribution: Rocky limestone soils and bare mountain ledges (reported as "abundant roadside weeds" by *King 4236*) along the northeastern flank of the Sierra Madre Oriental, southern Tamaulipas and adjacent San Luis Potosi. Mar.-Aug.

Specimens examined: Mexico: San Luis Potosi, ca. 1 mi. N of the San Luis Potosi-Hidalgo state border along highway 85, 23 Mar. 1961, *R. M. King 4236* (MICH, NY, TEX, UC, US); Las Canoas, 6–7 Aug. 1934, *F. W. Pennell 17928* (US); near Tamazunchale, 31 Mar. 1939, *A. E. Perkins & J. M. Hall 3525* (F); Rascon, Aug. 1911, *C. A. Purpus 5243* (F, GH, MO, NY, UC), *5244* (F, GH, NY, UC); about Tanquian, Mar. 1888, *E. Seler* 254 (GH). Tamaulipas, ca. 2 mi. NW of Gomez Farias, 19 June 1968, *A. Richardson 134* (TEX); 19 July 1968, *A Richardson 662* (TEX).

2. **Loxothysanus sinuatus** (Less.) Robinson, Proc. Am. Acad. 43: 43. 1907. *Bahia sinuata* Less., Linnaea 5: 160. 1830. Fragment of Holotype (GH): Veracruz, Cliffs near Hacienda de la Laguna, Sep. *Schiede 358*. *Bahia nepetaefolia* Gray, Proc. Am. Acad. 5: 184. 1861. Holotype (GH): Veracruz, Wartenburg near Tantoyuca in Huasteca Prov., 1858, *L. C. Ervendberg 65*. *Loxothysanus filipes* Robinson, Proc. Am. Acad. 43: 44. 1907. Holotype (GH): Veracruz, Steep banks of barancas, Zacuapan, May, 1906, *C. A. Purpus 1862* (in part). Isotype (UC). The type material is composed of robust and delicate forms; the latter were selected to typify the proposed species.

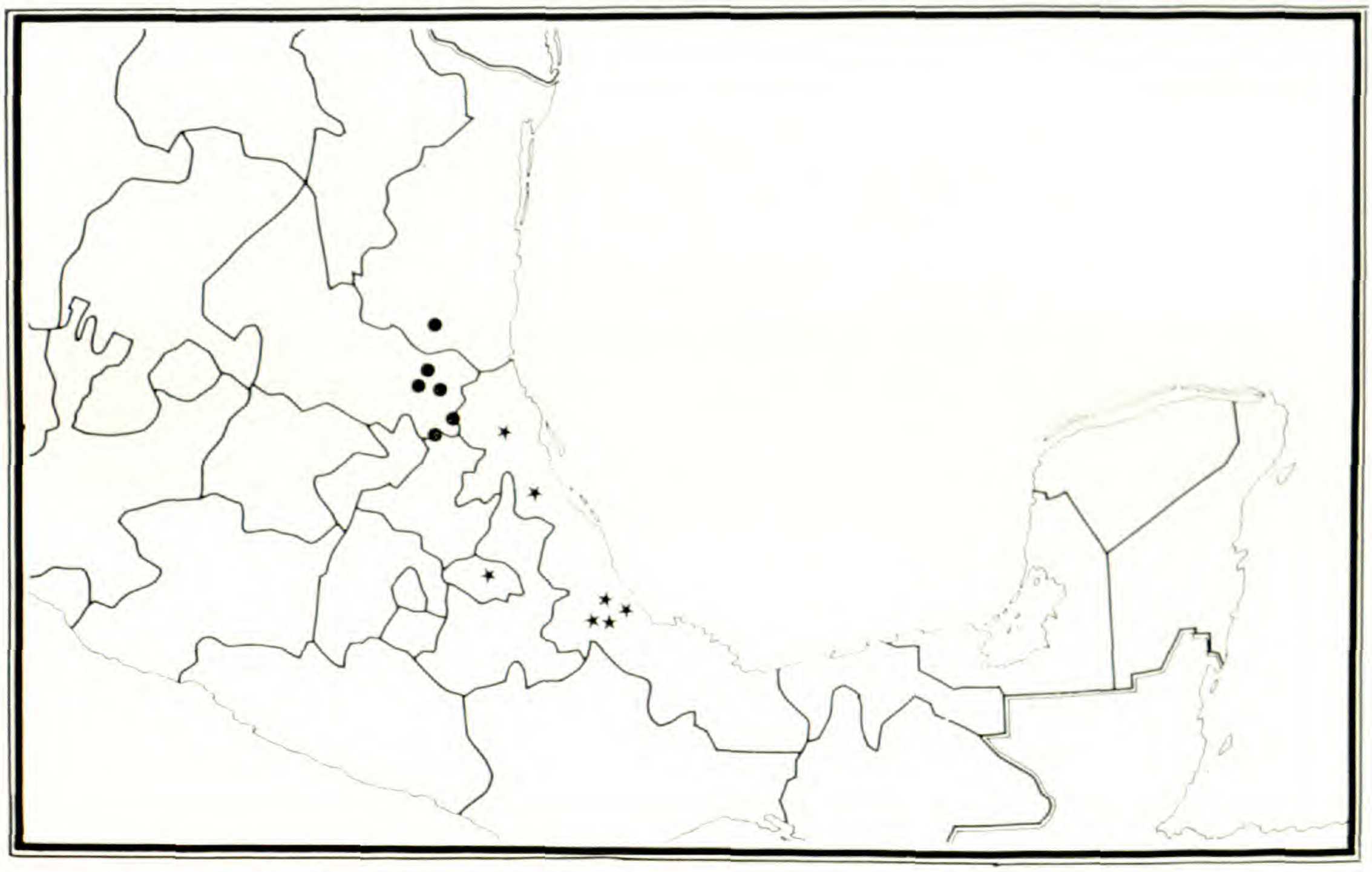

Fig. 2. Distribution of *Loxothysanus pedunculatus* (dots) and *L. sinuatus* (stars).

Perennial herbs, the stems variously bent or recurved, less often stiffly erect; leaves 1.0–12.0 cm. long, 1.0–7.0 cm. wide; blades thick, broadly ovate to deltoid, sinuate, commonly 3-lobed, narrowly obtuse to truncate at the base, densely white-tomentose beneath; heads in corymbs, the peduncles 0.5–2.5 cm. long; involucral bracts oblanceolate to obovate; florets and achenes about as described for *L. pedunculatus* but generally somewhat smaller.

Chromosome number, $n = 15$ pairs.

Distribution: Steep, rocky outcrops and barancas of Veracruz and Puebla from 1000 to 1200 m. Jan.-Dec., depending on rains.

Representative specimens: Mexico: Puebla, near Metlatoyuca, 27 Jan. 1898, *E. A. Goldman 27* (GH). Veracruz, 17 mi. SE of Jalapa, 19 Nov. 1959, *M. J. Johnston & J. Graham 4792* (MICH, NY, TEX, UC); Baranca del Fortin, San Martin Tlacotepec, Mar. 1935, *C. A. Purpus 16466* (US); Zacuapan, Sulphur Spring, Dec. 1906, *Purpus 2382* (F, GH, MO, NY, UC, US); Zacuapan, Baranca de Zacuapan, Mar. 1907, *Purpus 2381* (F, MO, NY, UC, US); Zacuapan, "on rocks," May 1929, *Purpus 8154* (GH, MO, NY, UC, US).

The two species of *Loxothysanus* are closely related but readily recognized by both vegetative and floral features. Both are quite variable, especially *L. pedunculatus*. The latter, for example, may occur as a roadside

weed (*King 4236*) and in such favorable habitats the plants apparently become quite robust with much larger, thinner leaves than is typical for the species.

This study was supported, in part, by NSF grant 5548X. I am grateful to Dr. John Strother of the University of California, Berkeley, for critically reviewing the manuscript.

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WRIGHTIA[1]

VOLUME 5 NOVEMBER, 1974 NUMBER 3

STUDIES OF AMERICAN PLANTS – VII

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Aside from work on accumulated collections of various families from the Maya Area, studies of the Myrsinaceae of Mexico and Central America have been resumed. Extensive collections received for identification from the Missouri Botanical Garden and the Field Museum of Natural History, particularly Myrsinaceae from Panama and Costa Rica, and Myrsinaceae and Mrytaceae from Guatemala, have yielded new species and significant extensions of range.

In my write-up of the Myrsinaceae in the Flora of Panama (Ann. Missouri Bot. Gard. 58: 285-353. 1971), I excluded *Ardisia compressa* H.B.K. from Panama. After a study of the type at Paris, I concluded that the species may be only a local endemic from the vicinity of Caripe, Venezuela, and that the use of this name for extensive populations in Central America, Mexico and the West Indies is perhaps ill advised (Wrightia 4: 153 and 160-161. 1971). Preliminary to the preparation of a treatment of the *A. compressa* complex, I am evaluating the Mexican representatives, and the study will be continued southward through Central America. Four new species of *Ardisia* from Mexico, namely *A. aurantiaca, A. digitata, A. Hintonii* and *A. Raveniana,* all originally named and distributed as *A. compressa,* are described. Other new Myrsinaceae include two additional species from Mexico in the *Ardisia nigrescens* Oerst. complex, one from Panama of uncertain affinity, five species of *Parathesis* from Guatemala and Panama, and a *Stylogyne* from Panama.

New species, new varieties, new combinations, and notable extensions of range are included in the Polygonaceae, Annonaceae, Lauraceae, Celastraceae, Hippocrateaceae, Violaceae, Myrtaceae, Labiatae, and Rubiaceae. A new genus of trees from the rain forest of Guatemala, *Mayanaea* in the Violaceae, and the beautiful *Physostegia nivea* from the Strybing Arboretum in San Francisco, California are among the notable additions to the American flora.

POLYGONACEAE

Coccoloba cozumelensis Hemsl. var. **tikalana** Lundell, var. nov.— Arbor, ca. 10 m. alta, ramulis crassiusculis, puberulis; folia petiolata, petiolo puberulo, 7–12 mm. longo, canaliculato; lamina chartacea vel subcoriacea, late ovata vel lanceolato-ovata, 5–10 (-15) cm. longa, 3–5 (-7) cm. lata, apice subabrupte acuminata, basi cordata, subcordata vel

[1]Published by The University of Texas at Dallas, Box 688, Richardson, Texas 75080.

rotundata; inflorescentia spicata, ad 12 cm. longa, puberula; ochreolae puberulae; pedicelli fructiferi nulli; fructus ovoideus, 5–6 mm. longus, apice obtusus.

Trees, 10–13 m. high, the branchlets rather stout, shallowly ribbed, puberulent at first; leaves drying dark, stoutly petiolate, the petioles arising from base of ocrea, usually curved, drying blackish, 7–12 mm. long, densely puberulent; leaf blades firm, chartaceous to subcoriaceous, broadly ovate to lanceolate-ovate, 5–10 (-15) cm. long, 3–5 (-7) cm. wide, the apex subabruptly acuminate or acuminate, the acumen acute to obtuse, the base shallowly cordate to rounded, puberulent and with crispate pubescence along the midvein and in nerve axils of lower surface, glabrous otherwise, the costa nearly plane above but with medial ridge, elevated and prominent beneath, the primary lateral veins 6 or 7 pairs, slender, elevated below and slightly so above; inflorescence spicate, densely flowered, puberulent, up to 12 cm. long, the ocreolae puberulent, small, less than 1 mm. long; fruits sessile, ovoid, drying 5–6 mm. long, inconspicuously costate, the perianth lobes imbricate, obtuse and elevated at apex.

Guatemala: Dept. Peten, Tikal National Park, Bajo del Hormiguero, south of Tikal on old Remate Road, in *tintal*, Feb. 13, 1959, *C. L. Lundell 15514* (LL, type), small tree, about 30 ft. high, ripe fruits blood-red, rather acid.

The type is representative of the population in the swamp forest around Tikal. Its leaves are broadly ovate and drying dark as in *C. Swartzii* Meisner. The Peten tree represents a southern variant of the species. Typical *C. cozumelensis* has smaller narrow leaves which characteristically are pale tan or yellow-brown when dry. The fruits of var. *tikalana* appear to be somewhat larger and more coronate, the pubescence coarser and denser, the leaf blade firmer and broader. All these are minor differences, but what other characteristics do we have to distinguish populations of related forms in this genus!

ANNONACEAE

Annona rufa Lundell, sp. nov. — Frutex scandens, ramulis novellis rufo-tomentosis; folia petiolata, petiolo rufo-tomentoso, 5–8 mm. longo; lamina chartacea, supra praeter costam demum fere glabrata, subtus pilis mollibus laxiuscule vestita, oblongo-elliptica vel obovato-elliptica, 6.5–14 cm. longa, 2.5–5 cm. lata, apice subabrupte acuminata, basi acutiuscula vel rotundata, costa supra impressa, subtus prominens; nervi laterales utrinque 7–8, subtus prominuli; flores solitarii, terminales vel infrapetiolares; pedicelli rufo-tomentosi, 8–10 mm. longi; sepala connata, extus rufo-tomentalla, ca. 6 mm. longa, apiculata; petala 3, crassa, rigida, extus rufo-tomentella, intus minute albo-tomentella, ovata, ad 2 cm. longa; stamina ca. 3 mm. longa, connectivo apice peltato incrassato, minute setuloso.

Woody vine, the branchlets often short, inconspicuously zigzag, rather rigid, rufous-tomentose; leaves petiolate, the petioles 5–8 mm. long; leaf blades chartaceous, softly rufous-pubescent along the veins like the petiole, the pubescence otherwise rather sparse, glabrous above except along the

impressed midvein, oblong-elliptic or obovate-elliptic, 6.5–14 cm. long, 2.5–5 cm. wide, apex subabruptly acuminate, the acumen up to 1.5 cm. long, base usually acutish or broadly obtuse-rounded, the lateral veins 7–8 pairs, elevated beneath like the costa; flowers solitary, terminal or infrapetiolar; pedicels short, bracteate, rufous pubescent, 8–10 mm. long; sepals connate, short pubescent with reddish appressed hairs, about 6 mm. long, prominently apiculate; petals 3, thick, rigid, finely rufous-tomentellous, the inner tomentum dense, minute and whitish, ovate, up to 2 cm. long, nearly as wide; stamens about 3 mm. long, the apical connective thick, hood-like, minutely setulose.

Guatemala: Dept. Alta Verapaz, Sebol, in high forest along Rio Sebol, July 30, 1964, *C. L. Lundell 18276* (LL, type), woody vine.

Referable to the Section Pilannona Safford, the species is related to *A. volubilis* Lundell of Peten and *A. scandens* Diels of Peru. It more closely resembles the latter, differing in its rufous indument, leaves acutish to obtuse-rounded at base, and with pedicels scarcely half as long. In *A. volubilis* the stems are slender and wiry, the leaves smaller and glaucous beneath, and the flowers are about half as large. The lianoid species of *Annona* are rare, and it is remarkable to discover two new ones in the rain forest of eastern Guatemala.

Cymbopetalum Hintonii Lundell, sp. nov. – Arbor parva, ramulis novellis dense puberulis; folia petiolata, petiolo 1.5–3 mm. longo; lamina membranacea, adulta glabra, anguste lineari-lanceolata vel lineari-oblonga, 10–15 cm. longa, 1.5–3.3 cm. lata, apice acuminata vel acuta, basi acuta; flores supraaxillares, solitarii; pedicelli ad 1.7 cm. longi, ebracteati, basi articulati; sepala late ovata, 5–6 mm. lata; petala exteriora plana, minute tomentella, late ovata, ad 1.5 cm. longa et lata, apice obtusa; interiora crassa, minute tomentella, cymbaeformia, late ovata, ad 2 cm. longa et lata, margine involuta; stamina ca. 3 mm. longa.

Tree, 8 m. tall, the branchlets very slender, at first densely puberulent; leaves short petiolate, the petioles 1.5–3 mm. long, puberulent at first, not canaliculate; leaf blades membranaceous, ciliolate at base at first, glabrous at maturity, narrowly linear-lanceolate or linear-oblong, 10–15 cm. long, 1.5–3.3 cm. wide, apex acute or acuminate, base acute, decurrent on petiole, the midvein nearly plane above, elevated beneath, the primary lateral veins 18–23 pairs, slender and slightly elevated on both surfaces, the reticulation open and evident above and beneath; flowers supra-axillary, solitary; pedicels short, blackish, glabrous or nearly so, up to 1.7 cm. long, ebracteate, articulate at base; sepals depressed ovate, 5–6 mm. wide, wider than long, rather thin, minutely puberulent; exterior petals rather thin, minutely tomentulose, broadly ovate, up to 1.5 cm. wide and long, obtuse at apex; interior petals thick, corrugate, minutely tomentulose, broadly ovate, up to 2 cm. long and wide, rounded at base with broad stipe, the margin involute; stamens numerous, about 3 mm. long, the flat apical connective obscurely and minutely setulose.

Mexico: Michoacan, Coalcoman, San Jose, in forest, alt. 1140 m., June 8, 1939, *Geo. B. Hinton et al. 13788* (LL, type), tree 8 m., fls. green.

With its long narrow willow-like leaves, and short pedicels, *C. Hintonii*

is well-marked. Its affinity appears to be with *C. stenophyllum* Donn. Smith of Guatemala.

Oxandra Proctori Lundell, sp. nov. — Arbor, ramulis novellis adpresse vestitis; folia petiolata, petiolo ad 3 mm. longo; lamina membranacea, lanceolata vel oblanceolata, 5–10 cm. longa, 1.3–2.8 cm. lata, apice acuminata, acumine obtusiusculo, basi subcuneata, acuta; flores axillares; pedicelli fructiferi ad 6 mm. longi, vestiti; sepala late rotundata, ca. 1 mm. longa; fructus subglobosus.

Tree, 20 m. tall, the branchlets very slender, finely pubescent at first with subappressed hairs; leaves membranaceous, usually glabrous, occasionally with a few appressed hairs along the midvein beneath, short petiolate, the petioles thickened, up to 3 mm. long, glabrate; leaf blades punctate, narrowly lanceolate or oblanceolate, 5–10 cm. long, 1.3–2.8 cm. wide, apex acuminate, the acumen obtusish, base subcuneate, acute, revolute, the costa plane above, elevated beneath, the veins slender and inconspicious on both surfaces; flowers axillary, apparently solitary, the pedicels bracteate at base, finely pubescent like the bracts at first, the pedicels of immature fruits up to 6 mm. long; the persistent sepals broadly rounded, about 1 mm. long; immature fruits subglobose, subsessile.

British Honduras: El Cayo District, 2.2 miles southeast of Holec Camp, Chiquibul Forest Reserve, in high forest, 1600–1700 ft., April 25, 1969, *George R. Proctor 30104* (LL. type), tree, 20 m. tall.

Like *O. guatemalensis* Lundell, this species has some resemblance to *O. lanceolata* (Sw.) Baill. of the West Indies. The narrower mostly oblanceolate leaves subcuneate at base, longer petioles, and solitary flowers with fruiting pedicels up to 6 mm. long are distinguishing characteristics which separate it from both *O. guatemalensis* and *O. lanceolata*.

LAURACEAE

Misanteca clavata (Lundell) Lundell, comb. nov. *Licaria clavata* Lundell, Wrightia 5: 32. 1974.

Misanteca conoidea (Lundell) Lundell, comb. nov. *Licaria conoidea* Lundell, Wrightia 5: 33. 1974.

Ocotea lenticellata Lundell, sp. nov. — Arbor, ramulis crassiusculis, angulatis, minute adpresse et dense puberulis; folia petiolata, petiolo 1–2.5 cm. longo, minute puberulo; lamina chartacea vel subcoriacea, lanceolata, oblongo-elliptica, obovata vel elliptica, 9.5–22 cm. longa, 3–8 cm. lata, apice subabrupte subacuminata, acumine obtusa vel acutiuscula, basi rotundata et acutiuscula, supra glabra, subtus novella minute puberula; inflorescentia anguste paniculata, ad 8 cm. longa, dense adpresse puberula; pedicelli fructiferi crassi, 1.5–10 mm. longi; cupula lenticellata, stipitata, late campanulata, 5–9 mm. longa, ad 7 mm. diam., minute puberula; bacca ellipsoidea, glabra, nigra, apiculata.

A small to medium sized tree up to 25 m. high, 40 cm. diam., the thickish branchlets angled, greyish, minutely but densely puberulent with appressed hairs; leaves mostly with long petioles, the petioles up to

2.5 cm. long; leaf blades chartaceous or subcoriaceous, variable in shape, lanceolate, oblong-elliptic, obovate or elliptic, mostly elliptic, usually large, 9.5–22 cm. long, 3–8 cm. wide, the apex usually broadly subacuminate, the acumen acutish or obtuse, apex sometimes rounded, base rounded or rounded and acutish, inaequilateral, at first minutely appressed puberulent beneath, especially along the costa and veins, glabrous above, the costa elevated beneath, nearly plane above, primary lateral veins 6 to 8 pairs, arcuately ascending, slender but conspicuous beneath, openly and inconspicuously reticulate veined on lower surface; inflorescence axillary, pedunculate, narrowly paniculate, branched at base, up to 8 cm. long, minutely and densely appressed puberulent; pedicels of fruits thick, usually short; cupule broadly campanulate, stipitate, 5–9 mm. long, up to 7 mm. in diam., minutely puberulent, conspicuously lenticellate; fruits ellipsoid, shining, black, glabrous, apiculate.

Guatemala: Dept. Izabal, Puerto Mendez, on Rio Dulce Road 8 km., in high forest, June 1, 1970, *Elias Contreras 9924* (LL, type), tree, 6 in. diam., 40 ft. high, *"laurel."* Also represented from the Department of Izabal by *Contreras 9914, 10071, 10075, 10288, 10291, 11364* and *11367*, all in the Lundell Herbarium. It has been collected in the Stann Creek District of British Honduras, *Percy H. Gentle 8811* (LL).

No flowers are available, but the relationship of the species appears to be with *Ocotea mayana* (Lundell) Lundell under which name the above collections were distributed. The larger leaves rounded at base and campanulate cupule notably differ from those of *O. mayana*, which has smaller leaves cuneate at base and a shallow oblongish cupule.

CELASTRACEAE

Elaeodendron trichotomum (Turcz.) Lundell, Lloydia 2: 101. 1939. *Maytenus trichotomus* Turcz., Bull. Soc. Nat. Moscou 31, pt. 1: 451. 1858.

Guatemala: Dept. Peten, El Ceibo, about 700 m. on village side, in *tintal*, March 29, 1965, *Elias Contreras 5375* (LL), tree, 35 ft. tall, 10 in. diam., flowers yellow-green.

This is the first record of the species for Peten. Its opposite and alternate crenate leaves, and well developed cymose inflorescences distinguish the taxon among the Celastraceae of the Maya area.

Schaefferia cuneifolia A. Gray var. **pedicellata** Lundell, var. nov.— Frutex; folia subspathulata vel oblanceolata, ad 15 mm. longa, 3–6 mm. lata, basi attenuata, cuneata, apice rotundata; drupa pedicellata, ellipsoidea.

Shrub, the twigs and leaves minutely scabridulous; leaves narrow, subspathulate or oblanceolate, up to 15 mm. long, 3–6 mm. wide, cuneate-attenuate at base, rounded at apex, reticulate veined; fruits pedicellate, the pedicels up to 2 mm. long; drupes ellipsoid, up to 5 mm. long, with persistent style about 1 mm. long.

Texas: Cameron County, El Jardin, common in blackland, alt. 30 ft., July 28, *Robert Runyon 295* (LL, type), a shrub.

The fruit of this variety is illustrated in Lundell, Flora of Texas, Vol. 2, *Pl. 35, fig. 3*. In the treatment of the species in the Flora of Texas

2: 350–351. 1969, differences in the populations were discussed. The variety is restricted to the Rio Grande Plains, but it intergrades even there into the typical form of the Edwards Plateau and Trans-Pecos counties. Glabrous, cuneate-obovate or ovate-elliptic leaves, and sessile globose drupes are typical of the species.

HIPPOCRATEACEAE

Hippocratea volubilis L. var. **circumalata** Lundell, var. nov. — Frutex scandens; ramuli glabri; folia glabra, petiolata, petiolo canaliculato, 6–10 mm. longo; lamina chartacea, glabra, oblonga, elliptica vel obovata, 6.5–12 cm. longa, 3–5 cm. lata, apice subacuminata, basi rotundata et acutiuscula vel acuta, crenata; inflorescentia minute puberula, ad 6 cm. longa; capsula elliptica vel ovata, apice late obtusa; semina circumalata, ad 4 cm. longa.

Woody vine, glabrous except for the minutely puberulent inflorescence; branchlets slender, quadrangular, reddish; leaves glabrous, with canaliculate petioles 6–10 mm. long, the leaf blades chartaceous, oblong, elliptic or obovate, 6.5–12 cm. long, 3–5 cm. wide, apex obtusely subacuminate, base rounded or acutish and slightly decurrent on petiole, the margin conspicuously crenate, the midvein elevated above as a narrow line above the base, prominent beneath, the primary veins slender, 5–8 pairs, arcuate-ascending, raised beneath; inflorescence in fruit up to 6 cm. long, pedunculate, branched; capsules coriaceous, elliptic or ovate, up to 5 cm. long, 3.5 cm. wide, rounded at base, broadly obtuse at apex; the seed with short basal wing and the wing produced distally surrounding the embryoniferous portion, circumalate, up to 4 cm. long, 1.2 cm. wide.

Guatemala: Dept. Peten, San Pedro, bordering San Pedro River, on riverbank 1 km. east of km. 160 of Cadenas Road, in low forest, Aug. 14, 1969, *Elias Contreras 8930* (LL, type), vine, fruit green.

All fruiting collections seen from this area have circumalate seeds, altogether different from the typical seed of *H. volubilis* which have large obovate-oblong somewhat falcate wings. As A. C. Smith indicated in his monograph (Brittonia 3: 366. 1940), the seeds of specimens from Guatemala and British Honduras are peculiar. No specimens in flower are available from this region which differ in foliage and inflorescences from typical *H. volubilis* as interpreted by Smith. But the seed differences between the species and the var. *circumalata* are such that they could be considered of generic importance in this family!

Pristimera tabascensis (Lundell) Lundell, comb. nov. *Hippocratea tabascensis* Lundell, Contr. Univ. Mich. Herb. 4: 16. 1940.

Mexico: Tabasco, Estapilla near Tenosique, June 18, 1939, *Eizi Matuda 3484* (LL, isotype), woody vine. Guatemala: Dept. Peten, Sayaxche, along bank of Rio Pasion, in acahual, Feb. 1964, *C. L. Lundell 18027* (LL), woody vine, flowers greenish.

With flowers available for comparison, it is obvious that this species is not a synonym of *P. celastroides* (H.B.K.) A. C. Smith, as considered by Smith from fruiting material (Brittonia 3: 372. 1940). The flowers of *P. tabascensis* differ notably from those of *P. celastroides* in having filaments deltoid-ligulate, widest at base, not constricted as in the latter

taxon. Also, the petals of *P. tabascensis* are ovate, rounded at apex, the sepals essentially entire. The large elliptic or ovate-oblong leaves, drying green, are distinctive.

In *P. tabascensis* the upper third of the capsule is coherent, and this feature extends down the sides gradually tapering out, giving the capsule a winged appearance, which raises generic questions.

Salacia petenensis Lundell, sp. nov. – Arbor parva, glabra, ramulis crassiusculis; folia opposita, petiolata, petiolo 8–11 mm. longo; lamina chartacea, elliptica vel oblongo-lanceolata, 15–20 cm. longa, 6.5–8.5 cm. lata, basi acutiuscula, apice acuminata, integra; pedicelli fructiferi lignosi, 5–6 mm. diam.; fructus globosus, ad 6 cm. diam.; semina oblonga, ad 3.8 cm. longa, 1.5 cm. diam.

Small tree, about 10 m. tall, 10 cm. in diam., glabrous, the branchlets green, terete, somewhat flattened at the nodes, the internodes elongated; leaves opposite, drying olive-green, petiolate, the petioles 8–11 mm. long, rugose, canaliculate, drying darker than blade; leaf blades chartaceous, elliptic or oblong-lanceolate, 15–20 cm. long, 6.5–8.5 cm. wide, broad and narrowed to the acutish or obtusish base, the apex acuminate, margin entire and thin with tendency to be revolute, the costa acutish, narrow and sharply elevated above, angled and prominent beneath, the primary lateral veins slender, 6–8 pairs, arcuately ascending, obscure above; fruits 1 or 2 to inflorescence, borne on thick pedicels 5–6 mm. in diameter, the stalks of fruits up to 8 cm. long, brownish; fruits globose, up to 6 cm. in diameter, in appearance like the fruits of the sapodilla tree, pulpy within, the pericarp drying hard and coriaceous, about 3 mm. thick; seeds usually 4, oblongish, up to 3.8 cm. long, rounded at ends.

Guatemala: Dept. Peten, on Sebol Road, in high forest about 12 km. from San Luis, Nov. 20, 1966, *Elias Contreras 6614* (LL, type), tree, 30 ft. high, 4 in. diam., fruits sapodilla-brownish, sweet.

In the absence of flowers, the generic position of this species is doubtful. It is unlike any other known to me from Central America. The large globose sapodilla-like fruits are noteworthy.

Tontelea hondurensis A. C. Smith, Brittonia 3: 486. 1940.

Guatemala: Dept. Peten, La Cumbre, in high forest, west of km. 137 of Cadenas Road, July 29, 1969, *Elias Contreras 8774* (LL), woody vine, flowers yellow; La Cumbre, 3 km. west of km. 137 of Cadenas Road, in high forest, July 29, 1969, *Contreras 8777* (LL), woody vine, fruit orange. Dept. Izabal, Puerto Mendez, on Rio Dulce Road, Cienaga, km. 26, in high forest, Sept. 22, 1970, *Contreras 10336* (LL), woody vine, flowers yellow-green; same locality, Sept. 23, 1970, *Contreras 10346* (LL), woody vine, fruit orange.

Known previously only from Atlantida in Honduras, this extension northward of its range was to be expected. The distinctive orange fruits are ellipsoid or obovoid, up to 3.5 cm. in diameter, 5.5 cm. long, with pericarp coriaceous and ligneous, up to 4 mm. thick, and with seed, usually 4, up to 3 cm. long. I have not seen the type, but the flowers agree in detail with Smith's careful description. The leaves superficially resemble those of *Cheiloclinium belizense* (Standl.) A. C. Smith, a common

species in the wet forest of southern British Honduras, Peten, Izabal and Alta Verapaz, but differ immediately in drying greener and in having base mostly rounded and abruptly acutish or decurrent on petiole.

VIOLACEAE

Mayanaea Lundell, gen. nov. — Arbores glabrae; stipulae breves caducae; folia alterna, chartacea, magna, anguste lanceolata vel oblanceolata, petiolata, caudato-acuminata, basi acuta vel attenuato-decurrens, margine remote serrulato-crenulata, nervis venisque prominentibus; flores 5-meri, cymosi, cymis laxe paucifloris, pedunculatis, axillaribus, bracteis usque ad 2 mm. longis, acuminatis; pedicelli usque ad 8 mm. longi; sepala 5, imbricata, late ovata, subaequalia, apice rotundata, basi haud producta; petalum inferum obcordatum, ad 8 mm. longum et latum, apice late emarginatum, basi unguiculatum, calcaratum, intus glandulosum; petalum superum parvum, 3–3.8 mm. longum; stamina ca. 3.8 mm. longa, filamentis complanatis, ad 0.7 mm. longis, antheris oblongis, ca. 1 mm. longis, connectiva lata apice in appendicem ovatum 2 mm. longum protracta; stylus crassiusculus, apice curvatus; capsula trivalvis, 1-locularis, coriacea, nigra, apice apiculata; placentae 3, parietales, ovulis 9; semina nigra, globosa.

Glabrous trees, up to 20 m. tall, 40 cm. diam., the branchlets drying blackish, the stipules thin, ovate-lanceolate, caudate-acuminate, up to 2 mm. long, caducous; leaves alternate, with slender petioles up to 2 cm. long; leaf blades thin, chartaceous, drying blackish to gray-green, narrow, apex caudate-acuminate, base acute and decurrent on petiole, the margin crenate-serrulate, usually with thick teeth; inflorescences glabrous, axillary, often arising in the upper leaf axils, subsessile to long-pedunculate; flowers few in open blackish cymes, whitish and lilac-blue or violet or white, the bracts thin, up to 3 mm. long, acuminate; pedicels articulate above base; sepals 5, imbricate, thin, broadly ovate, subequal, 2.2–3 mm. long, sessile, the apex rounded, conspicuously apiculate; petals 5, very unequal, the lowest up to 8 mm. long and wide, conspicuously spurred at base, the spur about 2.5 mm. long, the blade obcordate, broadly emarginate at apex, the two sides rounded, subabruptly narrowed below into broad claw above spur, with parallel fleshy thick glandular ridges within above spur, the glandular ridges with thick rounded lateral basal lobes; the lateral petals about 3.8 mm. long, 2.2 mm. wide, inaequilateral, rounded above; the two upper petals smaller, obovate-elliptic, about 3 mm. long, rounded at apex; stamens about 3.8 mm. long; anthers erect, about 1 mm. long, the cells opening by a longitudinal slit, with thin conspicuous ovate apical appendage about 2 mm. long; the filaments broad, about 0.7 mm. long; the androecium with two large fleshy glands on lower side opposite the larger lower petal; ovary free, sessile, 1-celled; placenta 3, parietal, ovules 9; styles about 2.8 mm. long, curved at apex; fruit capsular, trigonous, 3-valvate, coriaceous, sharply apiculate, drying black; seeds smooth, rounded, blackish.

When this tree was described as a species of *Orthion,* no flowers were available. Drying blackish in all parts and with apiculate capsules, it

was atypical. In *Orthion* all parts are pallid, the capsules rounded at apex, and the minute whitish flowers are not spurred.

Mayanaea has distinctive comparatively large colored flowers with the lower obcordate petal up to 8 mm. long and wide, unguiculate, prominently spurred at base, and with glandular ridges within. The one-celled ovary with only 9 ovules further distinguishes it. The tree is known only from the Department of Izabal in the rain forest of eastern Guatemala.

Mayanaea caudata (Lundell) Lundell, comb. nov. — *Orthion caudatum* Lundell, Wrightia 4: 38. 1968.

Guatemala: Dept. Izabal, south shore of Lake Izabal between Izabal and Mariscos, at sea level, May 29, 1966, *Gayle C. Jones & Lynden Facey 3512* (LL, type), tree 8 m., fruits green; Peten-Guatemala Road, in high forest on rocky hill, 6 km. from La Ruidoza, May 20, 1971, *Elias Contreras 10790* (LL), *10791* (LL), *10792* (LL), *10793* (LL), tree, 30–45 ft. tall, up to 10 in. diam., flowers whitish and lilac-violet or lilac-blue; El Estor, in high forest, Mar. 21, 1972, *Contreras 11442* (LL), tree, 60 ft. tall, 15 in. diam., flowers white.

The description of the flowers of *Mayanaea* is from *Contreras 11442*.

MYRSINACEAE

Ardisia aurantiaca Lundell, sp. nov. — Arbor parva, 5–7 m. alta, ramulis novellis minute lepidotis; folia petiolata, petiolo marginato, 5–10 mm. longo; lamina chartacea vel subcoriacea, glabra, lanceolato-oblonga vel anguste oblongo-elliptica, 7.5–17.5 cm. longa, 2–5.5 cm. lata, basi acuta, apice acuta vel acuminata; inflorescentia terminalis, pyramidalis, paniculata, pedunculata, ad 15 cm. longa, 14 cm. lata, basi dense lepidota, supra parce lepidota; flores 5-meri, corymbosi; pedicelli 5–8 mm. longi; sepala anguste lanceolata, 1.8–2 mm. longa, obtusiuscula vel obtusa, minute eroso-ciliolata; corolla 6–7 mm. longa; stamina 4.5–5 mm. longa; filamenta ca. 2 mm. longa; antherae lineari-lanceolatae, 3–3.4 mm. longae, apice emarginatae; ovarium glabrum; ovula parva, pluriseriata.

Small trees, 5–7 m. high, the branchlets rather slender, minutely lepidote; leaves petiolate, the petioles thickish, 5–10 mm. long, marginate to base, lepidote on lower surface; leaf blades chartaceous or subcoriaceous, glabrous, lanceolate-oblong or narrowly oblong-elliptic, 7.5–17.5 cm. long, 2–5.5 cm. wide, base acute and decurrent on the petiole, apex acute or short acuminate, the acumen of mature leaves obtusish, margin entire, the midvein stout and elevated beneath, shallowly impressed above, the primary lateral veins slender; inflorescence terminal, large, open, pyramidal, paniculate, up to 15 cm. long, 14 cm. wide, with short peduncle up to 1 cm. long, densely lepidote at base, sparsely lepidote otherwise; flowers corymbose, 5-parted; pedicels slender, 5–8 mm. long; sepals lanceolate to narrowly lanceolate, 1.8–2 mm. long, obtusish to broadly obtuse, minutely erose-ciliolate, punctate with small red or blackish glands; corolla 6–7 mm. long, the buds oblong-elliptic, the tube about 1.5 mm. long, the petals punctate with glandular lines; stamens 4.5–5 mm. long, attached to the corolla tube about 0.5 mm. above base; filaments slender, about 2 mm. long, sometimes sparingly glandular-

papillate below; anthers attached above base, linear-lanceolate, 3–3.4 mm. long, widest at base, thickish, dehiscent by small flaring apical pores, apex emarginate; ovary glabrous, the slender style 5–5.5 mm., not torulose with glands; ovules small, pluriseriate.

Mexico: Chiapas, Mt. Ovando, near Escuintla, Nov. 14, 1945, *Eizi Matuda 6159* (LL type); Mt. Ovando, alt. 1000 m., Nov. 14–18, 1939, *Matuda 3931* (LL), arbor parva, 5–7 m., flor roseus.

The filaments shorter than anthers and sparingly glandular below, the narrow sepals punctate with mostly small red-black glands, large flowers, emarginate anthers, and thickish mostly oblong leaves set the species apart. The glands of the flowers are mostly orange in color.

Ardisia auriculata Donn. Sm., Bot. Gaz. 24: 395. 1897.

Panama: Colon, ca. 2–3 miles up the Rio Guanche, lowland rain forest, elev. ca. 10–20 m., Jan. 19, 1973, *Helen Kennedy & Robin Foster 2191* (LL), tree 5 m., fruit red to purple; Veraguas, 3.9–5 miles N of Santa Fe, alt. 500–1000 m., Dec. 12, 1971, *Al Gentry 3003* (LL), tree, 4 m. tall, buds brown.

Described from Costa Rica, these are the first collections I have seen from Panama.

Ardisia digitata Lundell, sp. nov. – Arbor parva, 2.5–6 m. alta, ramulis lepidotis; folia petiolata, petiolo 4–6 mm. longo; lamina chartacea, obovata vel oblanceolato-oblonga, 6.5–13 cm. longa, 2.6–5 cm. lata, basi acuta vel acutiuscula, apice subabrupte acuminata, integra; inflorescentia terminalis, pyramidalis, basi lepidota, supra glabra, paniculata, 5.5–11.5 cm. longa et lata; flores corymbosi; pedicelli digitati, 3.5–6 mm. longi; sepala 5, ovata, ca. 1.2 mm. longa, minute nigro-punctata, acuta, ciliolata; corolla 5–5.5 mm. longa; stamina ca. 4.5 mm. longa; filamenta 1.7–1.9 mm. longa; antherae lineari-lanceolatae, ca. 3.5 mm. longae, acutae; ovarium glabrum; ovula parva, pluriseriata.

Small trees, the branchlets rather slender, lepidote at first; leaves petiolate, the petioles marginate, canaliculate, 4–6 mm. long; leaf blades chartaceous, obovate or oblanceolate-oblong, 6.5–13 cm. long, 2.6–5 cm. wide, base acute or acutish, apex subabruptly short acuminate, entire, the midvein elevated beneath, impressed above, primary lateral veins slender; inflorescences terminal, pyramidal, lepidote at base, essentially glabrous otherwise, broadly paniculate with short peduncle, 5.5–11.5 cm. long, equally as wide; flowers corymbose, with straight digitate rigid pedicels 3.5–6 mm. long; sepals 5, narrowly ovate, about 1.2 mm. long, black or reddish punctate with few small glands, the margin hyaline, ciliolate or minutely erose, apex usually acute; corolla 5–5.5 mm. long, the petals with pale linear glands, the tube short; stamens 4–4.5. long, borne on tube of corolla about 0.6 mm. above base; filaments slender, 1.3–1.8 mm. long, about half as long as anthers; anthers slender, widest at base, linear-lanceolate, 3–3.5 mm. long, attached near base, apiculate, dehiscent by small apical pores; ovary glabrous, the slender style 5–5.3 mm. long, punctate; ovules small, pluriseriate.

Mexico: Michoacan, Zitacuaro-Guanoro, beneath willows on ridge, October 7, 1938, *Geo. B. Hinton et al. 13339* (LL, type), 2.5 m. high, flowers pink.

Of affinity to *A. Hintonii* Lundell, the inflorescence, glabrous except at base, the digitate straight rigid pedicels, stamens borne on corolla tube above base, and filaments only half as long as the anthers separate the two. In *A. Hintonii* the filaments merely adhere to corolla tube, with attachment basal, and the filaments are longer than anthers which are smaller. The erose-ciliolate sepals are usually acute and less conspicuously punctate in *A. digitata*.

Ardisia Hintonii Lundell, sp. nov. – Arbor parva, ramulis novellis minute lepidotis; folia petiolata, petiolo canaliculato, marginato, ad 3 mm. longo; lamina chartacea, novella basi parce lepidota, anguste elliptica vel oblongo-lanceolata, 6.5–14 cm. longa, 2.5–4.5 cm. lata, basi acuta, apice acuta vel acuminata, integra; inflorescentia terminalis, pyramidalis, ad 8 cm. longa, minute lepidota; flores subcorymbosi; pedicelli 4–5.5 mm. longi; sepala 5, ovata, 1.3–1.5 mm. longa, integra, apice rotundata, dense et minute nigro-punctata; corolla 6–6.5 mm. longa; stamina ca. 5.5 mm. longa; filamenta 3 mm. longa; antherae lineari-lanceolatae, 2.8–3 mm. longae, acute apiculatae; ovarium glabrum; ovula parva, numerosa, pluriseriata.

Small trees, the branchlets slender, densely and minutely lepidote at first; leaves subsessile, the petioles marginate, canaliculate, up to 3 mm. long, lepidote; leaf blades chartaceous, lepidote at base a first, glabrous at maturity, narrowly elliptic or oblong-lanceolate, 6.5–14 cm. long, 2.5–4.5 cm. wide, base acute and decurrent on petiole, apex acute or short acuminate, margin entire, costa elevated beneath, impressed above, lateral veins slender; inflorescence terminal, pyramidal, with short peduncle, paniculate, up to 8 cm. long and equally as wide at base, minutely and densely lepidote; flowers 5-parted, subcorymbose; pedicels slender, lepidote, 4–5.5 mm. long; flower buds lanceolate, acute; sepals ovate or ovate-elliptic, 1.3–1.5 mm. long, apex rounded, thin, conspicuously punctate with minute black glands, the margins hyaline, entire; corolla 6–6.5 mm. long, with short basal tube about 1.6 mm. long, the petals with pale linear glands; stamens about 5.5 mm. long; filaments slender, fully 3 mm. long, adhering to corolla tube above base; anthers slender, linear-lanceolate, widest at base, attached near base, 2.8–3 mm. long, acutely apiculate, dehiscent by apical pores; ovary glabrous; style slender, 5 mm. long, punctate; ovules small, numerous, pluriseriate.

Mexico: Michoacan, Dist. Coalcoman, San Jose, in woods, alt. 900 m., June 12, 1939, *Geo. B. Hinton et al. 13794* (LL, type), tree, 6 m., fl. white.

The combination of subsessile leaves, inflorescence densely lepidote, broad thin sepals densely black punctate with minute glands, stamens with filaments longer than anthers, and very slender anthers well-mark the species.

Ardisia Raveniana Lundell, sp. nov. – Frutex, ca. 5 m., ramulis crassiusculis; folia petiolata, petiolo marginato, 5–10 mm. longo; lamina chartacea, glabrata, elliptica vel obovato-elliptica, 11–18 cm. longa, 5.8–7.8 cm. lata, integra, apice abrupte subacuminata, basi acuta; inflorescentia axillaris, sessilia, paniculata, ramosa, multiflora, lepidota, ad 10 cm. longa, 12 cm. lata; pedicelli 4–9 mm. longi; sepala 5, parva, minute

punctata, late ovata, 0.9–1.2 mm. longa, erosula, apice rotundata; corolla alba, ca. 6 mm. longa, petala elliptica, punctata; stamina 5–5.5 mm. longa; filamenta 1.8–2 mm. longa; antherae lanceolatae, 3–3.2 mm. longae, minute apiculatae; ovarium glabrum; ovula 13–16, pluriseriata, parva.

Shrub, about 5 m. tall, the branchlets rather thick, closely appressed lepidote at first; leaves large, marginate to base of petiole, petiolate, the petioles stout, 5–10 mm. long, lepidote on lower surface; leaf blades chartaceous, lepidote at base beneath along midvein at maturity, otherwise glabrous, elliptic or obovate-elliptic, 11–18 cm. long, 5.8–7.8 cm. wide, the margin entire, apex rather abruptly subacuminate or apiculate, the short broad acumen obtusish, base acute and decurrent on petiole, the costa shallowly impressed above, elevated beneath, the primary lateral veins slender; inflorescences axillary, paniculate, sessile, branched from the base, up to 10 cm. long, 12 cm. wide, multi-flowered, lepidote throughout; pedicels slender, 4–9 mm. long; sepals 5, small, broadly ovate, 0.9–1.2 mm. long, minutely erose, the apex rounded, rather conspicuously punctate with rounded red-black glands; corolla white, about 6 mm. long, with short tube at base; petals elliptic, punctate in lines and with conspicuous red-black rounded glands concentrated apically; stamens borne medially in corolla tube, 5–5.5 mm. long; filaments 1.8–2 mm. long; anthers basifixed, lanceolate, widest at base, 3-3.2 mm. long, rounded or subtruncate and minutely apiculate at apex; ovary glabrous, the slender style about 4.5 mm. long; placenta ovoid, small; ovules 13–16, pluriseriate, small.

Mexico: Chiapas, Municipio of Ocozocoautla de Espinosa, steep heavily wooded slope on the southwest side of the Presa de Malpaso, elev. 2200 ft., December 5, 1967, *Alush Shilom Ton 3332* (LL, type), flowers white, shrub 15 ft. tall.

A. Raveniana is unique among the Middle American species of this complex in having large sessile axillary inflorescences, paniculate and multi-flowered. The lepidote indument throughout the inflorescence, combined with the small broadly ovate thin sepals, white corolla conspicuously punctate with rounded red-black glands apically, and the slender pedicels further distinguish the species.

Dr. Peter H. Raven and his associates have contributed immensely to our knowledge of the flora of Chiapas, and it is a pleasure to name this species in his honor as a token of recognition for his labors.

Ardisia trinitariae Lundell, sp. nov. — Frutex, ramulis novellis puberulis; folia parva, petiolata, petiolo canaliculato, 3–6 mm. longo; lamina chartacea vel subcoriacea, dense punctata, margine novella ciliata, oblonga vel oblongo-elliptica, 6–8 cm. longa, 2.5–3 cm. lata, apice acuminata, basi acuta, crenulata; inflorescentia terminalis, pauciflora, parce puberula; flores 5-meri, umbellati; pedicelli 1.3–2.5 cm. longi; sepala lanceolata, ad 3 mm. longa, 1.3 mm. lata, ciliata, dense punctata; petala oblongo-elliptica, 10–12 mm. longa, ad 4 mm. lata, punctata; stamina 4–4.3 mm. longa; filamenta 1–1.3 mm. longa; antherae 3.2–3.7 mm. longae, apice obtusae, apiculatae, basi bulbosae; ovula pluriseriata.

Shrub about 2 m. tall, the branchlets slender, usually short, puberulent

at first with reddish hairs; leaves small, those subtending inflorescence usually reduced, petiolate, the petioles 3–6 mm. long, canaliculate, puberulent in unfolding leaf bud only; leaf blades glabrous at maturity, chartaceous to subcoriaceous, densely punctate, the unfolding leaf buds ciliate and puberulent along midvein on both surfaces, the margin crenulate, oblong or oblong-elliptic, 6–8 cm. long, 2.5–3 cm. wide, apex acuminate, base acute, decurrent on petiole; inflorescence terminal, with short peduncle, few-flowered, puberulent; flowers 5-parted, umbellate, the umbels subtended by small foliaceous bracts; pedicels slender, 1.3–2.5 cm. long, sparsely puberulent; sepals lanceolate, up to 3 mm. long, 1.3 mm. wide in flower, up to 4 mm. long in fruit, ciliate, conspicuously punctate; petals oblong-elliptic, 10–12 mm. long, up to 4 mm. wide, punctate medially in lines, marginally with rounded or elongated glands, notched at apex; stamens 4–4.3 mm. long; filaments glandular-puberulent below middle, 1–1.3 mm. long, curved; anthers drying blackish, the lobes bulbous at base, linear above, curved, 3.2–3.7 mm. long, basifixed, obtuse and sharply apiculate at apex, dehiscent by small apical pores; style slender, up to 8 mm. long; ovules pluriseriate.

Mexico: Chiapas, slope with *Liquidambar*, *Quercus* and *Pinus* at Lago de Monte Bello, 25 miles east of La Trinitaria, Municipio of La Trinitaria, elev. 5100 ft., April 13, 1965, *D. E. Breedlove 9721* (LL, type), flowers white, 6 ft. tall. Also, *Breedlove 9733* (LL), *14978* (LL), and *Ton 2599* (LL), all from the same general locality, are referable here.

Although the flowers are large as in *A. Carlsonae* Steyermark, *A. trinitariae* appears to have closer affinity to *A. erythrocarpa* Lundell, a lowland species of Peten. Its smaller stamens with anthers bulbose at base and short filaments distinguish it from the former. Like *A. erythrocarpa* its petals are comparatively narrow, up to 4 mm. wide. It differs from *A. erythrocarpa* in its coarser pubescence, much longer pedicels, larger flowers, anthers with lobes conspicuously bulbose at base, and in having oblongish leaves. It is notable that the leaves subtending the inflorescence are reduced in *A. trinitariae*.

Ardisia tuxtepecana Lundell, sp. nov. – Frutex; ramuli graciles, minute et dense puberuli; folia parva, petiolata, petiolo 2.5–3.5 mm. longo, subtus puberulo; lamina membranacea, lanceolato-elliptica, 3.5–6 cm. longa, 1.4–2.4 cm. lata, apice subabrupte caudato-acuminata, basi acuta, crenulata, dense punctata; inflorescentia terminalis, pauciflora; flores subumbellati; pedicelli parce puberuli, graciles, 1.7–2 cm. longi; sepala ciliata, ovato-elliptica vel elliptica, ca. 1.5 mm. longa, 1.2 mm. lata, dense punctata, apice rotundata; fructus parvus, globosus, ca. 6 mm. diam.

Shrub, the branchlets very slender, densely and minutely puberulent, the hairs reddish, appearing to be glandular; leaves small, thin, membranaceous, dark green, petiolate, the petioles canaliculate, 2.5–3.5 mm. long, puberulent on lower surface; leaf blades lanceolate-elliptic, 3.5–6 cm. long, 1.4–2.4 cm. wide, apex subabruptly caudate-acuminate, base acute, slightly decurrent on petiole, the margin crenulate, glabrous above, densely puberulent along midvein beneath, otherwise glabrous, conspicuously punctate; inflorescenec terminal, few-flowered, the peduncle very short; pedicels slender, sparsely puberulent, 1.7-2 cm. long; sepals

subtending fruits densely ciliate, ovate-elliptic or elliptic, about 1.5 mm. long, 1.2 mm. wide, rounded at apex, densely punctate; fruits small, globose, about 6 mm. in diameter.

Mexico: Oaxaca, Rancho "Los Caracoles," cerca de Tuxtepec, July, 1963, *J. M. Alcocer y C. Morales s.n.* (LL, type).

A. tuxtepecana is a very slender shrub with the smallest leaves in this complex. It appears to be nearest *A. brevipes* Lundell of Veracruz, but differs notably in its denser indument and longer almost glabrous pedicels. In *A. brevipes* the leaves are larger and glabrous, while in *A. tuxtepecana* the leaf midvein is densely puberulent its entire length beneath. The flowers of *A. tuxtepecana* are not known.

Another species of this group, *A. nigrescens* Oerst., has been collected at Tuxtepec, but it is a coarser shrub with branchlets densely hirsute-tomentose with matted dark red hairs, and with much larger sepals.

Ardisia veraguasensis Lundell, sp. nov. — Frutex, ramulis juventate minute et parce lepidotis; folia novella parce lepidota, petiolata, petiolo canaliculato, 3–5 mm. longo; lamina membranacea, elliptica, 10–12.5 cm. longa, 4.5–6 cm. lata, apice subabrupte acuminata, basi late obtusa vel rotundata, nigro-punctata, integra; inflorescentia terminalis, parce lepidota, paniculata, laxa, pauciflora, ca. 10 cm. longa; flores subcorymbosi, 5-meri; pedicelli ca. 3 mm. longi; sepala hyalina, late ovata, ca. 1.2 mm. longa, apice rotundata, minute erosula, parce punctata; petala ca. 3.5 mm. longa, basi connata, lanceolata, acuta, parce punctata, stamina ca. 2.4 mm. longa; filamenta ca. 0.5 mm. longa; antherae lanceolato-oblongae, ca. 2 mm. longae, obtusiusculae; ovula pluriseriata, minuta.

Shrub, 3 m. tall, the branchlets slender, rather sparsely lepidote at first; leaves at first sparsely lepidote on both surfaces, glabrous at maturity except for petioles, the petioles slender, canaliculate, short, 3–5 mm. long; leaf blades membranaceous, elliptic, 10–12.5 cm. long, 4.5–6 cm. wide, apex rather abruptly acuminate, the acumen about 1 cm. long, acute, base obtuse or rounded and decurrent on petiole, margin entire, the midvein shallowly impressed above, elevated beneath, the veins slender but conspicuous beneath, the primary veins about 10 pairs with intermediaries, reticulation open; inflorescence terminal, with short peduncle and slender branches, sparsely lepidote, open, paniculate, few-flowered, about 10 cm. long; flowers glabrous, subcorymbose, 5-parted; pedicels short, 3–3.5 mm. long; sepals thin, hyaline, broadly ovate or elliptic, about 1.2 mm. long, erosula, the apex rounded, punctate with a few conspicuous glands, the apical orange; corolla about 3.5 mm. long; petals asymmetrical, connate at base, white, lanceolate, acute, punctate with a few linear glands; stamens shorter than petals, about 2.4 mm. long; filaments about 0.5 mm. long, borne above base; anthers basifixed, eglandular, lanceolate-oblong, about 2 mm. long, obtusish, dehiscent by longitudinal slits; ovules pluriseriate, minute.

Panama: Veraguas, primary forest, alt. 700–1200 m., on Caribbean slope above Rio Primero Brazo, 5 miles northwest of Santa Fe, March 18–19, 1973, *R. L. Liesner 986* (LL, type), 3 meters tall, flowers white.

In its slender habit, rather conspicuously veined thin leaves, white small flowers, small hyaline sepals, sparingly punctate asymmetrical

petals, and anthers dehiscent by longitudinal slits, *A. veraguasensis* is amply distinct.

Parathesis costata Lundell, sp. nov. — Arbor parva, ramulis novellis minute adpresse tomentellis; folia petiolata, petiolo 1–2.5 cm. longo; lamina integra, chartacea, oblanceolata, 9.5–17 cm. longa, 2.5–5.3 cm. lata, apice acuta vel subacuminata, basi attenuata, acuminata, pellucido-punctata, novella parce stellato-puberula; inflorescentia terminalis, minute adpresse tomentella, paniculata, pedunculata; flores subcorymbosi; pedicelli fructiferi 4–6 mm. longi; sepala parva, 5 vel 6, ca. 0.8 mm. longa, acuta, minute puberula; fructus glaber, subglobosus, costatus.

Small tree, 10 m. high, 20 cm. diam., the branchlets minutely appressed pubescent with stellate hairs, glabrous early; leaves with long slender petioles, the petioles appressed pubescent, 1–2.5 cm. long; leaf blades chartaceous, oblanceolate, 9.5–17 cm. long, 2.5–5.3 cm. wide, apex acute or subacuminate, base attenuate, acuminate, decurrent on the petiole, pellucid-punctate, at first minutely stellate puberulent, the hairs appressed, glabrous at maturity, the midvein elevated beneath, impressed above, the primary lateral veins slender, up to 22 pairs; inflorescence terminal, paniculate, pedunculate, pubescent like the branchlets; flowers subcorymbose; fruiting pedicels slender, 4–6 mm. long, puberulent; calyx small, 5- or 6-parted, the sepals triangular, acute, about 0.8 mm. long, puberulent, not black-punctate; fruits depressed-globose, vertically costate, punctate, the apex of fruit and style glabrous.

Guatemala: Dept. Peten, Santa Elena, en el Camino para Melchor, km. 68, Bajo Venado, approx. 400 m. de la Carretera, lado noreste, Feb. 10, 1972, *Rolando Tun Ortiz 2259* (LL, type), arbusto 10 m. alto, 20 cm. diametro, fruto verde rojo.

Although only fruiting material is available, *P. costata* appears to belong with two lowland species, *P. Rothschuhiana* Mez of Nicaragua and *P. tenuifolia* Lundell of Panama, both poorly known. Its glabrous fruits and style, 5- or 6-parted flowers, minute calyx, and fruits drying vertically costate appear to set the species apart as distinct. Fruiting specimens are of little value in working our relationships.

Parathesis crassipes Lundell, sp. nov. — Frutex, ad 2 m., ramulis crassis, rufo-tomentosis; folia petiolata, petiolo marginato, 7–15 mm. longo; lamina membranacea, oblanceolata vel obovata, 11–16 cm. longa, 4–6 cm. lata, basi attenuata, apice subabrupte cuspidato-acuminata, supra glabra, subtus stellato-hispida, subintegra; inflorescentia terminalis, crassa, anguste paniculata, rufo-tomentosa; flores 5-meri, racemoso-corymbosi; pedicelli 2–3 mm. longi; sepala ca. 2 mm. longa, stellato-hispida; fructus subglobosus, ca. 6 mm. diam.

Shrub, 1–2 m. high, the branchlets rather thick, hispid-tomentose with red dendroid trichomes, the trichomes usually stipitate and with unequal elongated branches; leaves with stellate-tomentose petioles marginate to base, the petioles up to 15 mm. long; leaf blades membranaceous, oblanceolate or obovate, 11–16 cm. long, 4–6 cm. wide, cuneate narrowed at base and decurrent on petiole, apex subabruptly cuspidate-acuminate, the margin subentire, glabrous above at maturity, stellate-pubescent

beneath over entire surface with subsessile to stipitate trichomes, the trichomes with unequal elongated branches, the midvein nearly plane above, elevated beneath, the primary lateral veins slender, 12–14 pairs, widely ascending; inflorescence terminal, narrowly paniculate, the rachis thick, the branches short and thick, rufous-tomentose with dendroid trichomes; flowers racemose-corymbose, 5-parted; pedicels short, 2–3 mm. long; sepals narrowly triangular, about 2 mm. long, stellate-hispid; fruits subglobose, drying about 6 mm. in diameter.

Guatemala: Dept. Izabal, El Estor, in high forest, March 24, 1972, *Elias Contreras 11539* (LL, type), shrub, 5 ft. high, fruit reddish; same locality, *Contreras 11537* (LL), shrub, 7 ft. high, 2 in. diam., fruit dark red.

The thick rachis and short thick branches of the inflorescence are unique. *P. crassipes*, in pubescence and leaf form, is scarcely distinguishable from *P. sessilifolia* Donn. Sm. Flowering material is needed to evaluate the relationship.

A third collection from Izabal, *Rolando Tun Ortiz 2533* (LL), is referable here. That three collections all show the same inflorescence characteristics appears to be of significance.

Parathesis Croatii Lundell, sp. nov. — Arbor parva; ramuli crassi, minute adpresse tomentosi; folia longe petiolata, petiolo 3.5–4.5 cm. longo; lamina membranacea vel subchartacea, obovato-elliptica, 13–35 cm. longa, 6–12 cm. lata, apice obtusa, basi acuta, minute crenulata, supra novella parce stellato-tomentosa, subtus novella dense adpresse stellato-tomentosa; inflorescentia terminalis, paniculata, ad 20 cm. longa, minute rufo-tomentosa; flores corymbosi, 5-meri; pedicelli crassi, 4–6 mm. longi; sepala crassa, 1.8–2 mm. longa, acuta, punctata, extus puberula et papillosa; corolla ad 8.5 mm. longa, lineato-picta; stamina ca. 5 mm. longa; antherae versatiles, lanceolatae, ca. 2 mm. longae, dorso nigropunctatae; ovarium minute rufo-tomentosum; ovula 11 vel 12, biseriata, parva.

Tree, 4 m. tall, the branchlets thick, drying angled, finely tomentose with closely appressed brownish stellate hairs; leaves very large, at first with fine appressed bizonal pubescence beneath, thinly pubescent at maturity beneath, glabrous at maturity above, the petioles rather stout, long, canaliculate, marginate above, appressed tomentose, 3.5–4.5 cm. long; leaf blades thin, firmly membranaceous to subchartaceous, 13–35 cm. long, 6–12 cm. wide, apex obtuse, base attenuate, acute, decurrent on petiole, the upper leaves reduced, becoming spatulate and bractlike in inflorescence, the margin finely crenulate; inflorescence terminal, pyramidal, paniculate, closely appressed tomentose with minute, red-brown, stellate hairs, up to 20 cm. long, probably longer in flower and fruit; flowers puberulent and papillose, corymbose, 5-parted; pedicels thick, 4–6 mm. long; sepals thick, broadly triangular, 1.8–2 mm. long, acute, black-punctate with large glands; corolla at anthesis about 8.5 mm. long, the petals united at base, narrowly linear, villous within except at base, black punctate in lines; stamens about 5 mm. long; anthers versatile, lanceolate, about 2 mm. long, black punctate dorsally; filaments slender; ovary

depressed-pyramidal, minutely rufous-tomentose to base; style nearly glabrous; ovules 11 or 12, biseriate, small.

Panama: Bocas del Toro, a forest above RR stop at Milla 7.5, July 26, 1971, *Thomas B. Croat & Duncan M. Porter 16280* (LL, type), tree, 4 m. high, flowers pale lavender, fruits green, immature.

With only a fragment of a flower, and an inflorescence in bud, the material is scarcely adequate for description, but the species is well-marked. The small versatile anthers and large leaves place *P. Croatii* in the small group with *P. amplifolia* Lundell of Panama and *P. pyramidalis* Lundell of Columbia. From both it differs in its much larger leaves, nature of indument, larger corolla, and biseriate ovules.

Parathesis escuintlensis Lundell, sp. nov. — Frutex, ca. 2 m., ramulis crassiusculis ferrugineo-tomentellis; folia petiolata, petiolo 8–12 mm. longo; lamina chartacea, supra glabra, subtus novella minute adpresse tomentella, oblanceolata, 8–12 cm. longa, 2–3.5 cm. lata, apice acuminata, basi attenuata, acuminata, subintegra; inflorescentia axillaris, paniculata, minute ferrugineo-tomentella, ad 10 cm. longa, pedunculata; flores 5-meri, corymbosi; pedicelli 4–6 mm. longi; sepala anguste triangularia, 1.2–1.4 mm. longa, nigro-punctata, dense puberula; petala 4.5–5 mm. longa, anguste triangularia, minute villosa; stamina ca. 3 mm. longa; filamenta ca. 1.3 mm. longa, crassa; antherae lanceolatae, ca. 2 mm. longae, apiculatae, minute punctatae; ovarium cum stylo tomentellum.

Slender shrub about 2 m. tall, the branchlets angled, rather stout, minutely tomentose at first with closely appressed hairs; leaves small, petiolate, the petioles rather slender, canaliculate, pubescent beneath at first like the branchlets, 8–12 mm. long; leaf blades thin, chartaceous, glabrous above, at first closely appressed pubescent beneath with stellate hairs, almost glabrous at maturity, oblanceolate, 8–12 cm. long, 2–3.5 cm. wide, apex acuminate, base attenuate, decurrent, acuminate, the margin rather obscurely crenulate, the midvein impressed above, elevated beneath, the primary veins slender but elevated on lower surface; inflorescence axillary or in leafy panicles, with long peduncles, minutely ferruginous-tomentose, up to 10 cm. long in fruit; flowers 5-parted, small, corymbose; pedicels 4–6 mm. long, papillate and puberulent; sepals narrowly triangular, acuminate, 1.2–1.3 mm. long, densely black punctate with elongated glands, papillate and puberulent; petals 4.5–5 mm. long, narrowly triangular, densely short villous dorsally and within above middle and along edges, densely punctate with elongated black glands; stamens attached above base of corolla, about 3 mm. long; filaments stout, about 1.4 mm. long; anthers erect, dorsifixed one-third above base, lanceolate, about 2 mm. long, apiculate, with small red-black glands dorsally; ovary minutely villous-tomentose, the style about 4.5 mm. long, villous at base, with scattered hairs above; ovules about 9, uniseriate.

Guatemala: Dept. Escuintla, southern slopes of Volcan de Agua, cloud forests at an alt. of 6000-8000 ft., May 22, 1971, *F. Almeda 759* (LL, type), a slender shrub ca. 6 ft. tall, corolla white, anthers yellow, fruits black.

Of affinity to *P. leptopa* Lundell, the smaller flowers, and stamens with stout filaments much shorter than anthers, separate *P. escuintlensis*. In

P. leptopa the slender filaments equal or exceed the anthers in length, and the anthers are narrower with less punctation. In all features, *P. escuintlensis* is smaller.

Parathesis Williamsii Lundell, sp. nov. — Arbor parva, ramulis crassiusculis, novellis minute adpresse tomentellis; folia longe petiolata, petiolo 6–20 mm. longo; lamina chartacea, nigro-punctata, oblanceolata vel oblongo-oblanceolata, 6.5–12 cm. longa, 2–3.5 cm. lata, basi attenuato-acuminata, apice obtusa vel obtusiuscula, novella parce stellato-puberula, glabrata; inflorescentia terminalis, pyramidalis, novella minute tomentella; flores corymbosi; pedicelli 2–5 (-10) mm. longi; sepala 5, parva, 0.7–1 mm. longa, acuta; petala albo-papillosa, intus villosa, ca. 5 mm. longa; stamina erecta, ca. 3 mm. longa; filamenta crassa, ca. 1.2 mm. longa; antherae lanceolato-oblongae, ca. 2 mm. longae, minute et parce punctatae; ovarium glabrum; ovula 10–13, parva, uniseriata.

Small tree, 5 m. high, the branchlets at apex minutely appressed pubescent with stellate reddish hairs, glabrous early, shiny and black-punctate; leaves chartaceous, the petioles slender, 6–20 mm. long, finely appressed puberulent at first; leaf blades at first sparsely stellate-puberulent, glabrous at maturity, black-punctate, oblanceolate or oblong-oblanceolate, 6.5–12 cm. long, 2–3.5 cm. wide, base attenuate, acuminate, apex obtuse or obtusish, the midvein elevated beneath, impressed above, the primary veins slender, inconspicuous; inflorescence terminal and axillary, pyramidal, branched to base, exceeding leaves, black-punctate, shiny, the primary and secondary branches nearly glabrous, the inconspicuous scattered hairs stellate, the ultimate branches and pedicels finely and minutely puberulent, the indument reddish; flowers 5-parted, corymbose, often solitary and long-pedicelled at base of secondary branches, the pedicels 2–5 mm. long, those of solitary flowers up to 10 mm. long; calyx minute, the sepals triangular, 0.7–1 mm. long, acute, punctate with small black glands; petals linear-lanceolate, 5 mm. long, white, densely papillose on outer surface, villous within, punctate with conspicuous narrow lines; stamens erect, 3 mm. long, the filaments thick, about 1.2 mm. long, the anthers thick, lanceolate-oblong, about 2 mm. long, acutish, dorsifixed about one-third above base, punctate with few small reddish glands below middle dorsally; ovary strictly glabrous; placenta depressed-globose, ovules 10–13 in one series.

Guatemala: Dept. Alta Verapaz, cutover and secondary forest on hills about 8 km. SE of Coban, alt. 1500 ft., Jan. 29, 1969, *Louis O. Williams et al. 40275* (LL, type), tree 5 m. tall, white flowers.

This distinctive species apparently has affinity to *P. subcoriacea* Lundell of Chiapas, a species with much smaller flowers and subcoriaceous leaves. The white ovoid papillose flower buds, erect anthers punctate dorsally with few small reddish glands, the minute calyx, and slender petioled leaves, glabrous early, are features distinguishing *P. Williamsii*. There are numerous (10–13) minute ovules in a single basal series, a not too common occurrence in the genus.

Stylogyne darienensis Lundell, sp. nov. — Arbor parva, glabra; ramuli crassiusculi; folia petiolata, petiolo marginato, 4–8 mm. longo; lamina

opaca, chartacea vel subcoriacea, oblongo-elliptica, 10–16 cm. longa, 4–6 cm. lata, apice acuta vel acuminata, basi acuta, integra; flores dioici, 5-meri, umbellati; inflorescentia mascula glabra, axillaris, anguste paniculata, 1.2–3.5 cm. longa; pedicelli 3–3.5 mm. longi; sepala ovato-oblonga, ca. 1.5 mm. longa, apice rotundata, punctata; petala anguste oblonga, ca. 5 mm. longa, basi connata, punctata; stamina ca. 3.5 mm. longa; filamenta ca. 2 mm. longa; antherae oblongae, 1.5–1.7 mm. longae; ovarium abortivum.

Small glabrous tree, 5 m. tall, the branchlets rather slender; leaves drying brown, petiolate, the petioles conspicuously marginate to base, 4–8 mm. long; leaf blades densely punctate, chartaceous or subcoriaceous, oblong-elliptic, 10–16 cm. long, 4–6 cm. wide, the apex acute or short acuminate, base acute and conspicuously decurrent to base of petiole, margin entire, costa elevated beneath, the veins slender; flowers unisexual, 5-parted, umbellate, with only 2 or 3 in the umbels; staminate inflorescence glabrous, very slender, axillary, narrowly paniculate with several short primary branches, only 1.2-3.5 cm. long; pedicels slender, 3–3.5 mm. long; sepals thin, ovate-oblong, about 1.5 mm. long, rounded at apex, conspicuously punctate; petals thin, strongly reflexed, narrowly oblong, about 5 mm. long, connate at base, conspicuously punctate; stamens attached in corolla tube, about 3.5 mm. long; filaments very slender, about 2 mm. long; anthers basifixed, oblong, 1.5–1.7 mm. long; ovary abortive.

Panama: Darien, slopes of Cerro Chucula, drainage of Rio Pavarando, Feb. 11, 1972, *Al Gentry 4161* (LL, type), tree 5 m., flowers and inflorescence white.

This genus, primarily South American, is so poorly known that description of new species can not be undertaken with any confidence. With unisexual flowers, the species are seldom collected. *S. darienensis* appears to have affinity to *S. venezuelana* Mez which has smaller more numerous flowers.

MYRTACEAE

Eugenia cobanensis Lundell, sp. nov. – Arbor parva, 3 m. alta., ramulis novellis dense subvelutinus; folia parva, novella subsericea, petiolata, petiolo 1.5–3 mm. longo; lamina chartacea vel subcoriacea, lanceolata vel anguste elliptica, 3–5.5 cm. longa, 1–1.8 cm. lata, apice acuminata, basi obtusa vel rotundata, nervo medio supra impresso; racemis 1–4 mm. longis, abbreviatis; pedicellis subnullis, ca. 0.5 mm. longis, crassis; bracteolis persistentibus, ovatis, ca. 0.5 mm. longis, acutis; calycis lobis late ovatis, ca. 1 mm. longis, apice rotundatis, puberulis; disco ca. 1.2 mm. lato.

Small tree, 3 m. tall, the young growth subvelutinous, the older branchlets and inflorescences hispidulous; leaves small, silky pubescent at first with appressed hairs, the petioles short, 1.5–3 mm. long, canaliculate; leaf blades chartaceous to subcoriaceous, lanceolate or narrowly elliptic, 3–5.5 cm. long, 1–1.8 cm. wide, apex acuminate, base rounded or obtuse, the midvein impressed above, elevated beneath, the slender lateral veins 8–10 pairs, forming a submarginal vein, obscure above; racemes axillary,

abbreviated, hispidulous, rarely up to 4 mm. long, 4-sided; pedicels of young fruits only about 0.5 mm. long, thick; bracteoles small, ovate, about 0.6 mm. long, acute, persistent, connate slightly at base; young fruits nearly glabrous; calyx lobes subequal, broadly ovate, scarcely 1 mm. long, rounded at apex; disk about 1.2 mm. in diam.

Guatemala: Dept. Alta Verapaz, wet, mixed forest and thickets, hills of Sierra de Chama, along Rio Coban, about 5 km. east of Coban, alt. 1300 m., Feb. 6, 1969, *Louis O. Williams et al. 40644* (LL, type), small tree, 3 m. tall.

In the absence of flowers, the species can not be placed with any certainty, but it appears to be near *E. rufidula* Lundell. *E. cobanensis* has distinct pedicels up to 2 mm. long, and leaves mostly rounded at base.

Psidium protractum (Griseb.) Lundell, comb. nov. *Calycorectes protractus* Griseb., Cat. Pl. Cub. 284. 1866.

LABIATAE

Physostegia nivea Lundell, sp. nov. — Herba perennis, rhizomatosa; folia glabra, sessilis; lamina chartacea vel subcoriacea, anguste oblongo-lanceolata, oblanceolato-elliptica vel anguste oblonga, 6.5–15 cm. longa, 1–3.5 cm. lata, basi lata, apice acuminata, raro acuta, adulta serrata; inflorescentia dense puberula, paniculata; calycibus campanulatis, ca. 8 mm. longis, dentibus ovato-deltoideis, acuminatis; corolla alba, ad 2.5 cm. longa; filamenta villosa.

Erect, perennial, rhizomatous herb, the rhizomes slender, white, elongated, spreading to form dense colony; stems stout, squarrose, with twelve or more nodes below inflorescence, glabrous; leaves sessile, glabrous, chartaceous to subcoriaceous, narrowly oblong-lanceolate, oblanceolate-elliptic or narrowly oblong, 6.5–15 cm. long, 1–3.5 cm. wide, tapering to the broad base, usually acuminate, sometimes acute, the margin of young basal leaves denticulate, the mature leaves serrate, the teeth sharp and incurved, the midvein conspicuous, the primary lateral veins slender, only 3 or 4 pairs, inconspicuous, strongly ascending at a sharp angle, the terminal pair extending from the middle to apex of leaf, remote from margin, minutely punctate; racemes spike-like, forming large leafy terminal panicle, the upper leaves reduced, the uppermost bract-like, the racemes up to 15 cm. long, finely and densely puberulent, the flowers subsessile; calyx campanulate, about 8 mm. long at anthesis, with teeth ovate, 2 mm. long, sharply acuminate, finely puberulent, the subtending puberulent bractlets shorter than calyx tube; corolla snowy white, glabrous, up to 2.5 cm. long (fresh flowers), the narrow tube shorter than calyx, broadly inflated and campanulate above basal tube, the upper lip broad, truncate-rounded, 6 mm. long, 7.5 mm. wide at base, erect, hooded, the lower lip three-lobed, the lateral lobes rounded, 3.5–4 mm. long, erose, recurved, the middle lobe about 6 mm. long, emarginate, strongly reflexed at apex; stamens subequalling the hooded upper lip of corolla, the filaments villous above; ovary green, giving the base of the corolla tube a greenish hue within.

Texas: Dallas County, Dallas, cultivated in garden at 7043 Desco Drive, June 10, 1974, *C. L. Lundell 18837* (LL, type), perennial rhizomatous herb, corolla snowy white.

In the nature of its rhizomes and in superficial appearance, *P. nivea* resembles *P. virginiana* (L.) Benth. The latter flowers from August to November, while *P. nivea* belongs to the spring and early summer flowering group which flowers from April to July. On June 7, the colony of *P. nivea* in the Strybing Arboretum in San Francisco, California, was in flower bud, while on June 10, plants in my garden at Dallas were starting to flower. My garden planting in Dallas is from the Strybing Arboretum colony in Bed No. 17. This is a beautiful garden plant worthy of widespread cultivation.

P. nivea has snow white corollas, flowers essentially sessile, and thickish subcoriaceous leaves with only 3 or 4 pairs of sharply ascending lateral veins. In these features, it differs notably from *P. virginiana*. Since the name *P. virginiana* has been associated with the colony of *P. nivea* in the Strybing Arboretum, it is significant to point out that the two species differ sharply otherwise in the nature of the corolla, the corolla of *P. nivea* being sharply inflated above the short basal tube, and the middle lower lobe is strongly reflexed. In *P. virginiana* the rose-purple corolla tapers above the basal tube, and the middle lower lobe is almost straight at anthesis, not reflexed. *P. praemorsa* Shinners, a related species which I grow in my observation garden, has the reflexed lower middle corolla lobe as in *P. nivea*, but its rhizomes are very short, the plant growing in compact clones, which is an advantage in a garden species. Both *P. virginiana* and *P. nivea* have long slender rhizomes, the plants spreading widely in each growing season.

RUBIACEAE

Chiococca mexicana Lundell, sp. nov. — Arbor parva, 5 m. alta, ramulis crassiusculis; folia glabra, longe petiolata, petiolo canaliculato, ad 2 cm. longo; lamina subcoriacea, elliptica, lanceolato-elliptica vel obovato-elliptica, 6–9.5 cm. longa, 2.5–4 cm. lata, apice subabrupte acuminata, basi acuta; inflorescentia axillaris, minute puberula, anguste paniculata, ad 4.5 cm. longa; pedicelli 1.5–4 mm. longi; hypanthium cum calyce glabrum; sepala parva, glabra, ovata, ca. 1 mm. longa, basi connata; corolla alba, glabra, campanulata, ca. 12 mm. longa, lobis ovatis, ca. 3 mm. longis, obtusis; stamina ca. 9 mm. longa; filamenta basi pilosa, ca. 5 mm. longa; antherae ca. 14 mm. longae, apiculatae; fructus ignotus.

Small tree, 5 m. tall, the branchlets rather thick, glabrous; leaves glabrous, the petioles long and slender, canaliculate, up to 2 cm. long; leaf blades subcoriaceous, elliptic, lanceolate-elliptic or obovate-elliptic, 6–9.5 cm. long, 2.5–4 cm. wide, apex subabruptly acuminate, base acute, decurrent, the midvein shallowly sulcate above, elevated beneath, the primary lateral veins 5 or 6 pairs, rather obscure on both surfaces; inflorescence axillary, green, minutely puberulent, narrowly paniculate, the panicles with few short branches, few-flowered, up to 4.5 cm. long; pedicels puberulent, 1.5–4 mm. long; hypanthium and calyx glabrous, green; calyx small, about 1 mm. long, the sepals united to middle, thickish, glabrous, ovate; corolla white, glabrous, campanulate, inflated from above base, about 12 mm. long, the lobes reflexed, ovate, about 3

mm. long, obtuse; stamens about 9 mm. long; filaments pilose to above middle, about 5 mm. long; anthers linear, about 4 mm. long, apiculate; style thick, 11 mm. long; stigma fleshy, capitate.

Mexico: Puebla, Tespilco, Municipio de Zacapoaxtla, bosque de encino, ladera de cerro, alt. 1800 m., April 23, 1970, *F. Ventura A. 955* (LL, type), arbusto de 5 m. de alto, flores blancas, crece en lugares sombrios; escasa.

C. mexicana appears to have affinity to *C. pachyphylla* Wernham. It is notable for its white campanulate corolla with short ovate lobes.

WRIGHTIA[1]

VOLUME 5 JUNE, 1975 NUMBER 4

STUDIES OF AMERICAN PLANTS – VIII

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Over the years since 1928 when field work was initiated, my collecting in British Honduras and Guatemala, as well as that of my able field assistants, chiefly the late Percy H. Gentle and Elias Contreras, has been slowly but increasingly facilitated, especially in Peten, by the opening up of airfields, and the clearing of roadways into the hinterlands. A 1933 expedition into Peten via Belize took days by river boat up the Belize River to El Cayo, and then by mule train along the trail via Yaxha and El Remate to Lake Peten Itza, and onward by water and road to Flores and La Libertad (Lundell: *The Vegetation of Peten*, Carnegie Inst. Publ. 478, viii + 243, 39 pls., 3 figs. Washington, 1937). In 1959 another program of exploration was initiated in Guatemala, and it took less than two hours by DC-3 to go from Guatemala City to Lake Peten Itza and on to Tikal.

Now that the country is being opened up by new roads cutting deeper yearly into areas that were accessible only by trails in earlier days, botanical exploration can proceed at an accelerated rate. Hopefully, collectors can cover the areas ahead of the new settlers who are eagerly clearing away the forest for new villages and milpas.

Some parts of Belize (formerly British Honduras), Izabal, Peten, Baja Verapaz, Alta Verapaz and other departments of Guatemala have been only superficially explored or remain virgin territory. In a new program of exploration, which began in January, 1975, assisted initially by Elias Contreras, intensive collecting has been started in selected areas of Peten, Izabal and Baja Verapaz, and this will be expanded into Belize and elsewhere in Middle America.

How little the area is known botanically is reflected in my studies of the new as well as the earlier collections accumulated in the Lundell Herbarium. Increasingly, the field effort is being concentrated on obtaining complete material in selected plant groups. Special field attention given during the past three decades to the Myrtaceae, Lauraceae, Celastraceae, Nyctaginaceae, Violaceae and Myrsinaceae has doubled the number of known taxa in these families in the Maya area. This intensive collecting has been shifted now to the Sapotaceae and other families in which I have a special interest.

PROTEACEAE

Roupala mayana Lundell, sp. nov. — Arbor parva; ramuli graciles vel crassi; folia parva, longe petiolata, petiolo 1.5–4 cm. longo, basi supra

[1]Published by The University of Texas at Dallas, Box 688, Richardson, Texas 75080.

puberulo; lamina coriacea, glabra, ovata, elliptica vel obovata, 3.5–8 cm. longa, 1.8–4.5 cm. lata, apice obtusa, acutiuscula vel raro rotundata, basi cuneata, margine integra vel subcrenata; inflorescentia racemosa, glabra, ad 12 cm. longa; pedicelli 4–5 mm. longi; sepala glabra, 8–9 mm. longa, supra ad 1 mm. lata; stamina ad 3 mm. longa; antherae acutae; ovarium glabrum.

Small tree, up to 10 m. high, 30 cm. diam.; branchlets varying from slender to thick with leaves usually crowded toward apex, glabrate; leaves small, with elongated slender petioles 1.5–4 cm. long, the petioles flattened and puberulent above at base; leaf blades coriaceous or rigidly coriaceous, glabrous, ovate, rhombic, elliptic or obovate, 3.5–8 cm. long, 1.8–4.5 cm. wide, apex usually obtuse, sometimes acutish or rounded, base cuneate and conspicuously decurrent on the petiole, the margin entire to rather inconspicuously crenate, the midvein plane above, elevated beneath, the primary lateral veins 3 or 4 pairs, elevated on both surfaces, ascending at a very acute angle, with slender intermediaries; racemes many-flowered, usually axillary, up to 12 cm. long, the rachis essentially glabrous, the minute scattered reddish hairs scarcely discernible where present; pedicels of flowers essentially glabrous, 4–5 mm. long; perianth slender, yellowish, glabrous, only 8–9 mm. long, the segments scarcely 1 mm. wide above, reflexed above; stamens inserted about 3 mm. below apex, subsessile, the anthers linear, acute; disk scales ovoid, fleshy, about 0.4 mm. long; pistil about 8 mm. long, glabrous, the ovary oblong, the style clavate and enlarged above, the apex obtuse.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, west of km. 141/142 of the Peten-Izabal Road, March 12, 1975, *C. L. Lundell & Elias Contreras 19087* (LL, type), tree, 30 ft. high, 12 in diam., flowers yellow-greenish.

Both *R. repanda* Lundell of Belize and *R. mayana* have flowers less than 9 mm. long, much smaller than those reported for *R. borealis* Hemsl. In *R. mayana*, which has smaller mostly obtuse entire or subcrenate leaves, the rachis of the racemes, the pedicels, perianth and ovary are essentially glabrous, while in *R. repanda* these parts are densely pubescent. The leaves of *R. repanda* are much larger, caudate-acuminate and repand or coarsely dentate.

OLACACEAE

Schoepfia macrophylla Lundell, sp. nov. — Frutex vel arbor parva, glabra, ramulis angulatis; folia glabra, petiolata, petiolo crasso, marginato, 2–3 (–4) mm. longo; lamina chartacea, lanceolata, ovato-lanceolata vel ovata, 7.5–16 cm. longa, 2.7–7 cm. lata, apice acuminata vel caudato-acuminata, basi acutiuscula, subtriplinervia, supra subbullata; inflorescentia racemosa, axillaris, glabra, pedunculata, pedunculo 3–4 mm. longo; flores 1 vel raro 2, sessiles; calyx parvus, ca. 1.2 mm. altus; drupa ellipsoidea, 1 cm. longa, apice annulata.

Arborescent shrub or small tree, up to 12 m. high, 12.5 cm. diam., glabrous, the branchlets slender, drying angled, green; leaves alternate, glabrous, with short thick petioles, the petioles marginate, shallowly canaliculate, 2–3 (–4) mm. long; leaf blades chartaceous, paler beneath,

lanceolate, ovate-lanceolate or ovate, 7.5–16 cm. long, 2.7–7 cm. wide, apex attenuate, acuminate or caudate-acuminate, base acutish, sometimes inaequilateral, subtriplinerved, the primary lateral veins slender, usually only 2 or 3 pairs, sometimes 2–4 pairs, the lower extending to above middle of blade or higher, the midvein elevated beneath, impressed above, the upper leaf surface subbullate; racemes 1- or 2-flowered, axillary, solitary, glabrous, with stout peduncles 3–4 mm. long, fruits sessile; calyx small (subtending fruits), glabrous, cyathiform, about 1.2 mm. high, fleshy, splitting irregularly; drupes ellipsoid, 1 cm. long, pinkish when ripening, annulate near the apex, the ring up to 4 mm. in diam.

Guatemala: Dept. Izabal, Cadenas, Semosh, northeast of Cadenas-Rio Dulce Road, about 10 km. from Cadenas, in high forest, *zapotal*, Feb. 17, 1975, *C. L. Lundell & Elias Contreras 18994* (LL, type), tree, 35 ft. high, 5 in. diam., fruit pinkish; same locality and date, *Lundell & Contreras 18995* (LL), arborescent shrub, 20 ft. high, 4 in. diam., fruit pinkish.

In the absence of flowers, the relationship of the species is doubtful, but its affinity appears to be with *S. Schreberi* Gmel. which is rather common in Peten. The large subtriplinerved leaves of *S. macrophylla* probably are fleshy for they dry brittle. They are acuminate or sometimes sharply caudate, and otherwise differ from those of *S. Schreberi* in size, venation, paler undersurface, and subbullate uppersurface.

CAPPARIDACEAE

Capparis izabalana Lundell, sp. nov. – Frutex, ramulis novellis minute puberulis; folia petiolata, petiolo 1.5 mm. ad 5.5 cm. longo, minute puberulo; lamina membranacea, lanceolata vel lanceolato-elliptica, 5–21.5 cm. longa, 1.6–8 cm. lata, apice acuminata vel caudato-acuminata, basi emarginata vel obtusa, costa subtus minute puberula; inflorescentia terminalis, pauciflora, racemosa, minute puberula; pedicelli 2.5–4 cm. longi; sepala 4, libera, crassa, lanceolata, ca 2.5 mm. longa, acutiuscula, glabra, intus glandulosa; fructus longe stipitatus, oblongus, 6–9 cm. longus, ad 1.7 cm. diam.; semina 7–10.

Shrub, up to 3 m. high, 5 cm. diam., the branchlets slender, drying green, very minutely puberulent at first; leaves reduced and subsessile above, the lower large and with long slender petioles, the petioles 1.5 mm. to 5.5 cm. long, very shallowly canaliculate or flattened above, the short ones thick, the longer slender, minutely puberulent; leaf blades membranaceous, lanceolate or lanceolate-elliptic, 5–21.5 cm. long, 1.6–8 cm. wide, the apical reduced leaves emarginate at base, the larger leaves narrowed to an obtuse base, apex acuminate or sharply caudate-acuminate with acumen up to 2.5 cm. long, paler beneath with whitish veins, primary lateral veins 7–10 pairs, widely ascending, slender, evident on both surfaces, the veins reticulate, the costa nearly plane above, elevated and minutely puberulent beneath, the blade otherwise glabrous; inflorescence terminal, subsessile, few-flowered, the 2 or 3 flowers racemose, the rachis 2–3 mm. long, minutely puberulent; pedicels slender, 2.5–4 cm. long, obscurely and minutely puberulent; sepals 4, thick, lanceolate, 2.5 mm. long, acutish, incurved at apex, glabrous, with large rounded fleshy gland at base within; stipe slender, glabrous, 3–3.5 cm. long; fruit oblongish,

somewhat torulose, 6–9 cm. long, up to 1.7 cm. in diameter, tapering to apex and base, glabrous, 7–10-seeded, the seed coat reddish-black, smooth, shining.

Guatemala: Dept. Izabal, Cadenas, in high forest, *zapotal*, on Arenales Road about 5 km. west of the village, Feb. 16, 1975, *C. L. Lundell & Elias Contreras 18981* (LL, type) shrub, 12 ft. high, 2 in. diam., young fruit green. Dept. Peten, Los Arcos, km. 143 of Cadenas Road, in high forest, west, Dec. 8, 1969, *Contreras 9300* (LL), shrub, 9 ft. high, 2 in. diam.

C. izabalana has very unequal petioles, the reduced uppermost leaves being subsessile while the lower are on long slender petioles up to 5.5 cm. long. In this respect the species resembles *C. Baducca* L. to which it may have affinity. *C. izabalana* differs from *C. Babucca* in its thin membranaceous leaves, whitish beneath, and in having elongated pedicels and stipes and much larger fruits with smooth shiny seeds.

EUPHORBIACEAE

Sapium guatemalense Lundell, sp. nov. – Arbor parva, vel ad 23 m. alta, 45 cm. diam., ramulis glabris, crassiusculis; folia glabra, petiolata, petiolo 5–13 mm. longo, apice biglanduloso; lamina membranacea, glabra, oblanceolata vel oblanceolato-elliptica, 8–15 cm. longa, 2.2–6.5 cm. lata, apice subabrupte acuminata, basi cuneata; flores unisexuales; spicae glabrae, ad 10 cm. longae; ovarium glabrum, biloculare; capsula rugosa, glabra, subglobosa, ad 1 cm. diam.

Tree up to 23 m. high, 45 cm. diam., usually smaller, glabrous, with reddish exudate drying on the branchlets like varnish; branchlets slender to thick; leaves thin, membranaceous, glabrous, drying dark green, petiolate, the petioles slender, 5–13 mm. long, shallowly canaliculate, with two elevated glands near base of blade; leaf blades subentire, oblanceolate or oblanceolate-elliptic, 8–15 cm. long, 2.2–6.5 cm. wide, apex subabruptly acuminate, the acumen short, flat, acutish or obtusish, base cuneate, midvein elevated beneath, the primary lateral veins slender, 6–8 pairs, arcuately ascending, not conspicuous; flowers spicate, unisexual. *Staminate* spikes solitary, 2.5–6 cm. long, very slender, glabrous; staminate flowers in scattered sessile glomerules, the calyx 3-lobed, the lobes broadly ovate, cucullate, fully 1 mm. long, glabrous. *Pistillate* spikes solitary, slender, 3–10 cm. long, glabrous; pistillate flowers few, sessile or subsessile, remote and with interrupted distribution along rachis, the calyx 3-lobed, the lobes ovate-deltoid, 1.2–1.8 mm. long, acutish, fimbriate, with alternating subequal stout filaments; ovary superior, glabrous, 2-celled; stigma large, flat fleshy, lobed, wider than ovary. *Capsules* rugose, glabrous, subglobose, up to 1 cm. in diameter, 2-seeded, the seed with bright red aril.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, on Coban-Salama Road, 3 km. west, Feb. 8, 1975, *C. L. Lundell & Elias Contreras 18961* (LL, type, pistillate flowers), tree, 40 ft. high, 8 in. diam., fruits green; Union Barrios, in high forest, 2 km. north, Feb. 9, 1975, *Lundell & Contreras 18976* (LL, staminate flowers), tree, 40 ft. high, 10 in. diam., flowers greenish; Union Barrios, on Salama-Coban Road, in high forest on hill, north of km. 148/149, Feb. 7, 1975,

Lundell & Contreras 18950 (LL, staminate flowers), shrub, 20 ft. high, 3 in. diam., flowers green; Chilasco, in high forest on rocky hill, Tierra Caliente, 15 km., Aug. 3, 1971, *Contreras 10944* (LL), tree, 70 ft. high, 18 in. diam., fruit capsular, "*cafeto.*"

The hard, red, varnish-like residue on branchlets and floral spikes is a notable feature of the taxon. The generic position of the species is doubtful.

Sapium itzanum Lundell, sp. nov. — Arbor, ca. 23 m. alta, 50 cm. diam., glabra; folia parva, petiolata, petiolo 1–2.2 cm. longo, apice glanduloso; lamina chartacea, obovato-elliptica vel oblongo-oblanceolata, 3–7 cm. longa, 1.3–3 cm. lata, apice rotundata, apiculata, glandulosa, recurvata, basi subcuneata vel subacutiuscula, denticulata et glandulosa, nervis 7–10-jugis; spicae terminales; fructu tantum viso, bene pedicellato, pedicello 2.5–4 mm. longo; columella ad 1 cm. longa, semine arillo coccineo praedito 6 mm. longo, 5 mm. lato.

Tree, about 23 m. high, 50 cm. diam., entirely glabrous, with rather slender short branchlets; leaves small, petiolate, the petioles slender, 1–2.2 cm. long, canaliculate, bearing at apex two slender stipitate glands 0.5–1 mm. long; leaf blades chartaceous, obovate-elliptic or oblong-oblanceolate, 3–7 cm. long, 1.3–3 cm. wide, apex rounded, apiculate, the apiculate tip recurved over the upper surface of blade, base subcuneate or acutish, the margin denticulate and with scattered small, oval, pitted glands, the midvein prominent beneath, elevated above as a narrow medial ridge, the primary lateral nerves slender, irregularly spaced, arcuate, 7–10 pairs; fruiting inflorescence terminal, very short, the rachis 1–3 cm. long, stout, usually with only 1–3 fruits; fruiting pedicels thick, 2.5–4 mm. long; capsules vertically grooved, up to 1.3 cm. long, epicarp woody, hard, apiculate, the columella about 1 cm. long; seeds about 6 mm. long, 5 mm. diam., with bright red aril.

Guatemala: Dept. Peten, Lake Peten Itza, Santa Elena, km. 1 of road, in clearing, Sept. 9, 1966, *Elias Contreras 6051* (LL, type), tree, 70 ft. high, 20 in. diam., fruit green.

S. itzanum is a very distinct small-leaved species related to *S. oligoneurum* Schumann & Pittier, but differing at once from that taxon in having mostly obovate leaves and larger capsules with fruiting pedicels up to 4 mm. long. The short lateral branchlets give the taxon a distinctive appearance. Another species of this affinity is *S. Bourgeaui* Croizat of Veracruz, which has quite different larger leaves.

Sapium mammosum Lundell, sp. nov. — Arbor parva, glabra, ramulis crassiusculis; stipulae parvae; folia glabra, petiolata, petiolo 1.5–4 cm. longo, canaliculato, apice biglanduloso; lamina lucida, membranacea, oblonga, oblongo-elliptica vel raro oblanceolata, 8.5–18 cm. longa, 3.5–6.5 cm. lata, apice obtusa, basi rotundata; spicae terminales, crassiusculae, 3.5–7 cm. longae; flores feminei sessiles; calyx parvus; ovarium glabrum, 2- vel 3-loculare.

Small tree, entirely glabrous, the branchlets rather slender to thickish, drying green; stipules persistent, obliquely ovate-deltoid, less than 2 mm. long, minutely erose-ciliolate at first; leaves glabrous, long petiolate be-

low, the petioles of apical reduced leaves short, sometimes only 5 mm. long, petioles mostly 1.5–4 cm. long, slender, canaliculate, with two small short elevated mammose glands at apex; leaf blades lustrous, thin, membranaceous, oblong, oblong-elliptic or sometimes oblanceolate, 8.5–18 cm. long, 3.5–6.5 cm. wide, apex obtuse or broadly obtusely apiculate but nearly plane, eglandular, base of lower leaves rounded, the base of reduced upper leaves narrowed and acutish, the midvein shallowly grooved or plane above, elevated beneath, the primary lateral veins slender and about equally evident on both surfaces, about 15 pairs, widely arcuate, not regularly spaced, anastomosing near the margin, the reticulation fine and open, the margin with scattered pitted glands, otherwise subentire; pistillate spikes terminal, rather stout, 3.5–7 cm. long; pistillate flowers sessile with large elliptical nearly flat gland on each side at base, the small bracts ovate-rounded, ciliolate; calyx at first cupulate, thin, about 0.8 mm. high with irregular margin, rupturing and apparently 2-lobed after anthesis; ovary glabrous, 2- or 3-celled; stigmas elongate, the free part incurved, whorled.

British Honduras: El Cayo District, north of the Belize River at Baking Pot, wooded alluvial banks, alt. about 250 ft., May 1, 1969, *George R. Proctor 30211* (LL, type), small tree with white latex.

S. mammosum bears a resemblance to *S. nitidum* (Monachino) Lundell, but appears to differ from that taxon in its thin leaves with more numerous primary lateral veins and sessile pistillate flowers with thin cupulate calyx. The young capsules are sessile or subsessile. The apex of the leaf is mostly plane but sometimes slightly cucullate, and eglandular.

Sapium ovalifolium Lundell, sp. nov. — Arbor, ad 15 m. alta, 60 cm. diam.; ramuli graciles; folia membranacea, petiolata, petiolo 1–3 cm. longo; lamina ovalia vel obovato-elliptica, 4.5–10 cm. longa, 3–5 cm. lata, apice rotundata et late apiculata, minute cucullata, basi rotundata vel late cuneata et acutiuscula, biglandulosa; glandulae hemisphaericae; costae secundarie 8- vel 9-jugae, laxae; ramuli spicas singulas terminales vel axillares gerentes; masculi ad 15 cm. longi, graciles; feminei terminales, ad 6.5 cm. longi; pedicelli fructiferi crassi, ca. 2 mm. longi; capsula parva, globosa.

Tree, up to 15 m. tall, 60 cm. diam., the branchlets slender, rather short; leaves membranaceous, brittle, with slender canaliculate petioles 1–3 cm. long; leaf blades oval or obovate-elliptic, 4.5–10 cm. long, 3–5 cm. wide, the apex rounded and broadly apiculate, inconspicuously cucullate, base rounded or broadly cuneate, acutish, with two short mammose glands at base, the margin obscurely crenulate-serrulate, the midvein plane above, elevated beneath, the primary lateral veins 8 or 9 pairs, arcuately ascending, very slender; staminate and pistillate spikes solitary, mostly terminal, rarely axillary on nodes of old wood, the staminate slender, up to 15 cm. long, the fruiting axis up to 6.5 cm. long, crowded with capsules; staminate flowers subtended by two large flat oblong peltate glands below the small deltoid bract, the calyx 2-lobed, the lobes ovate, imbricate; stamens 2, exserted; rachis of fruiting spikes up to 6.5 cm. long, crowded,

the pedicels thick, about 2 mm. long; capsules small, globose, about 8 mm. long; columella fully 5 mm. long; seeds tuberculate.

Mexico: Veracruz, along banks of Rio Tonti, Ejido de Olmilinga, 6 km. west of Campo Experimental de Hule, El Palmar, Zongolica, June 8, 1944, *Jose Vera Santos 3040* (TEX, type, staminate fls.), tree, 2 ft. diam., 15 m. tall, perianth green-yellow; same locality, *Santos 3039* (TEX, fruits), tree, 1.5 ft. diam., 12 m. tall, fruits green.

This belongs to the poorly known *S. lateriflorum* Hemsl. complex, in which a number of distinct species appear to be pigeon-holed. Only extensive field work with the collection of adequate materal will make possible the recognition of the taxa involved.

The comparatively small very thin mostly oval leaves with 8 or 9 pairs of arcuate primary veins, the short-pedicelled small capsules, and elongate staminate spikes are features which appear to distinguish *S. ovalifolium*. The leaves are shallowly cucullate at the apex.

Sapium veracruzense Lundell, sp. nov. – Arbor glabra; ramuli graciles; folia petiolata, petiolo 1.2–2 cm. longo, canaliculato; lamina membranacea, glabra, nitida, obovata, elliptico-obovata vel oblanceolata, 6.5–11 cm. longa, 2.5–4.5 cm. lata, apice subabrupte subacuminata, glandulosa, recurvata, basi obtusa vel rotundata, stipitato-biglandulosa, crenulato-serrulata, nervis 8–11-jugis; spicae terminales, 5.5–11 cm. longae, solitariae; flores masculi; glandulae patelliformae.

Tree, entirely glabrous, the stems, branchlets and petioles drying blackish, lustrous; branchlets rather slender; leaves glabrous, very thin, membranaceous, drying blackish, comparatively short petiolate, the petioles 1.2–2 cm. long, canaliculate; leaf blades rather lustrous, obovate, elliptic-obovate or oblanceolate, 6.5–11 cm. long, 2.5–4.5 cm. wide, apex subabruptly subacuminate, the apiculum glandular, recurved over the upper surface like a claw, base of blade obtuse or rounded with two small but well developed stipitate glands, the midvein shallowly impressed, nearly plane above, rather slender and elevated beneath, the primary lateral nerves 8–11 pairs, very slender, irregularly spaced, arcuately ascending at a wide angle, almost equally evident on both surfaces, the margin crenulate-serrulate; staminate spikes terminal, solitary, 5.5–11 cm. long, pedunculate, glabrous, drying black, the glomerules of flowers crowded above, remote below, each subtended by two saucer-shaped glands with raised margins; flower buds subglobose; pistillate flowers and fruits unknown.

Mexico: Veracruz, Coscomatepec, May 10, 1937, *Eizi Matuda 1334* (LL, type), tree.

The glandular recurved clawed apex of the leaves and the nature of the petiolar glands indicates a possible relationship between *S. veracruzense* and *S. Bourgeaui* Croizat from Orizaba, Veracruz. *S. Bourgeaui* is described as having elliptic leaves with about 15 pairs of lateral veins, and with petioles 3–4 cm. long. In *S. veracruzense* the leaves widest above the middle with fewer lateral veins and petioles not over 2 cm. long well-mark the taxon as distinct. *S. Bourgeaui* is based on a sterile specimen.

Sebastiania pubiflora Lundell, sp. nov. — Arbor, ca. 13 m. alta, 25 cm. diam.; ramuli graciles; folia chartacea, petiolata, petiolo 3–9 mm. longo, canaliculato, apice eglanduloso; lamina glabra, oblanceolata vel oblanceolato-oblonga, 7–15 cm. longa, 1.5–5 cm. lata, apice acuminata, acutiuscula vel obtusa, basi acutiuscula, denticulata et margine saepe glanduligera, costae secundariae utrinque 7–11, tenues; spicae axillares, 3.5–7.5 cm. longae, minute villosae; bracteae parvae, basi utrinque glandula instructae; ovarium dense et minute villosum.

Tree, about 13 m. high, 25 cm. diam.; branchlets rather slender, the buds and tips of branchlets with short appressed hairs, essentially glabrous; leaves glabrous, chartaceous, paler beneath, petiolate, the petioles canaliculate, 3–9 mm. long, without apical glands; leaf blades oblanceolate or oblanceolate-oblong, 7–15 cm. long, 1.5–5 cm. wide, apex plane, short acuminate, acutish or obtuse, base acutish or obtusish, usually with one or two rather conspicuous marginal glands near base, the margin denticulate and with occasional scattered pitted glands, the midvein nearly plane above, prominent beneath, the primary lateral nerves rather remote and irregularly spaced, 7–11 pairs, anastomosing near the margin, slender, the veins openly reticulate, the venation rather obscure on upper surface; spikes axillary, finely short villous, 3.5–7.5 cm. long, mostly staminate, but some with a solitary pistillate flower near base; the bracts ovate, acute, with a pair of oval free glands at base, the staminate flowers subsessile or stipitate, the calyx small, 2-lobed; ovary densely short-villous, sessile, 2- or 3-celled; stigma with 2 or 3 thick recurved lobes free almost to base.

Guatemala: Dept. Bajo Verapaz, Union Barrios, on Salama-Coban Road, in high forest on hill, south of km. 146/147, Feb. 4, 1975, *C. L. Lundell & Elias Contreras 18908* (LL, type), tree, 40 ft. high, 10 in. diam., flowers yellow-green.

Two earlier collections from Union Barrios, *Contreras 11211* (LL) and *11342* (LL), represent the same species. They are described as trees 80–100 ft. high, 20–35 in. diam.

In its short petioles and axillary spikes, the taxon must resemble *S. Tuerckheimiana* (Pax & Hoffm.) Lundell which was described from Alta Verapaz, and known to me only from the original description. The exceptional villous indument of the spikes apparently distinguishes *S. pubiflora*, for this is not mentioned by Pax and Hoffman.

Sebastiania Tuerckheimiana (Pax & Hoffm.) Lundell, comb. nov. *Sapium Tuerckheimianum* Pax & Hoffm., Pflanzenreich IV. 147, xiv: 61. 1919.

CELASTRACEAE

Microtropis mayana Lundell & Williams, sp. nov. — Frutex vel arbor parva, glabra, ramulis rubris; folia parva, chartacea vel coriacea, glabra, petiolata, petiolo canaliculato, 2–3.5 mm. longo; lamina anguste elliptica vel oblanceolata, (2–) 3.5–5 cm. longa, (5–) 10–20 mm. lata, apice acuta vel obtusa, basi acuta, integra, revoluta; cymae parvae, 3-florae, raro 1-florae, ad 7 mm. longae, pedunculatae; sepala 4 vel 5, erosula, rotundata; capsula matura obovoidea, 1–1.4 cm. longa, apiculata.

Shrub or small tree, up to 13 m. tall; branchlets glabrous, dark red, lenticellate, shiny, short and slender but rigid, usually angled; leaves small, firmly chartaceous to rigidly coriaceous, glabrous, petiolate, the petioles short, rigid, canaliculate, 2–3.5 (–5) mm. long; leaf blades narrowly elliptic or sometimes oblanceolate, (2–) 3.5–5 cm. long, (5–) 10–20 mm. wide, apex acute to obtuse, base acute and decurrent on petiole, the margin entire, revolute, midrib elevated on both surfaces, primary lateral veins 4- or 5-pairs, slender and inconspicuous on lower surface, obscure above, openly reticulate; cymes glabrous, axillary or in axils of bracts on short leafy tipped shoots, the cymes mostly 3-flowered, often reduced and 1-flowered, the peduncles 2–4 mm. long, rigid, stout, bibracteate above at base of lateral flowers; flowers 4- or 5-parted, subsessile to short-stalked, the thick pedicels rarely up to 1.5 mm. long; the basal bracts thick, ovate, up to 1.5 mm. long, acute, with red erose margin; sepals 4 or 5, unequal or in pairs, the outer pair reduced one-half, depressed-orbicular, up to 2.5 mm. wide, 1.5 mm. high subtending fruits, smooth, with reddish erose margin; capsules obovoid, 2-valved, 1–1.4 cm. long at maturity, apiculate, the aril conspicuous.

Guatemala: Dept. Huehuetenango, between San Mateo Ixtatan and Santa Eulalia, Sierra de los Cuchumatanes, in wet cloud forest of *Quercus-Pinus Ayacahuite*, dripping with mosses and hepatics on branches, alt. 2800–3100 m., Aug. 1, 1942, *Julian A. Steyermark 49898* (LL, type; F, isotype), shrub 20 ft. tall, flowers greenish (young buds), leaves dark green above and shining, paler green beneath, coriaceous; Sierra de los Cuchumatanes, Municipio of San Mateo Ixtatan, slope with *Pinus* along road to San Pedro Soloma, 3 miles southwest of San Mateo Ixtatan, elev. 9600 ft., Feb. 6, 1965, *D. E. Breedlove 8612* (F, LL), shrub, 15 ft. tall (mature capsules). Other collections of the species from Dept. Huehuetenango are *Steyermark 48427* (F, LL), *48468* (F, LL), *49800* (F), *50074* (LL), and *Breedlove 11510* (LL).

No mature flowers are available, but *M. mayana* appears to represent a small leaved species with reduced cymes of close affinity to *M. guatemalensis* Sprague and *M. contracta* Lundell. I had referred all these collections tentatively to the former. In *M. contracta* the larger wider leaves are paler beneath and truly elliptic, with the cymes 3- or 5-flowered and very compact. *M. guatemalensis* has larger open cymes with distinctly pedicellate flowers. The small obovoid capsules, mostly solitary and on short thick stalks, serve further to distinguish *M. mayana*.

Dr. Louis Williams has studied the species and I am glad to share with him the distinction of describing it.

MYRTACEAE

Calyptranthes salamensis Lundell, sp. nov. – Frutex, ramulis novellis rufo-strigosis; folia petiolata, petiolo canaliculato, 4–6 mm. longo; lamina novella rufo-strigosa, glabrata, subcoriacea vel coriacea, lanceolata vel anguste elliptica, 5–8.5 cm. longa, 1.5–2.6 cm. lata, apice acuminata, basi acuta; inflorescentia pauciflora, axillaris, anguste paniculata, 1.5–5 cm. longa, novella rufo-strigosa; fructus subglobosus, ca. 1 cm. diam.

Shrub, about 4 m. high, 7.5 cm. diam., the branchlets very slender but

rigid, terete, densely strigose at first with appressed reddish dibrachiate hairs, glabrate early; leaves reddish-strigose in young stages of development, glabrate, petiolate, the petioles canaliculate, 4–6 mm. long; leaf blades only slightly paler beneath, subcoriaceous or coriaceous, lanceolate or narrowly elliptic, widest at middle, 5–8.5 cm. long, 1.5–2.6 cm. wide, apex acuminate, sometimes caudate-acuminate, base acute and decurrent, the midvein impressed above, elevated beneath, the primary lateral veins about 15 pairs with intermediaries, slender and obscure beneath, scarcely evident above, punctate on upper surface with minute impressed glands; inflorescence (in fruit) 1.5–5 cm. long, the narrow few-flowered panicles paired in the axils of terminal nodes of old branchlets, or sometimes basal and opposite on a leafy shoot, pubescent at first with short reddish appressed dibrachiate hairs, traces of hairs persistent to maturity of fruits; peduncle rigid, 1–2.8 cm. long; flowers unknown; fruits depressed-globose, up to 1 cm. diam. (1-seeded), larger when 2-seeded, the surface glandular, with some short dibrachiate hairs persistent, especially around collar; collar about 1 mm. high, 2 mm. diam., with persistent dibrachiate hairs on outer surface; apparently glabrous within; calyptra shallowly dome-shaped, apiculate.

Guatemala: Dept. Baja Verapaz, Union Barrios, on Salama-Coban Road, in high forest, pineland, about 2 km. west, Feb. 4, 1975, *C. L. Lundell & Elias Contreras 18912* (LL, type), shrub, 12 ft. high, 2 in. diam., fruit pink or reddish, "*guayabillo*."

In some aspects resembling *C. Lindeniana* Berg, the species may be easily distinguished from that taxon by having strigose rather than long shaggy pubescence, smaller few-flowered inflorescences, and coriaceous somewhat wider mostly elliptic leaves. *C. paxillata* McVaugh, a poorly known species, appears to be related.

Eugenia barriosana Lundell, sp. nov. – Frutex, ramulis gracilis, glabris; folia chartacea, glabra, petiolata, petiolo rugoso, canaliculato, 4–6 mm. longo; lamina anguste elliptica vel oblanceolata, 6–8.5 cm. longa, 2.5–3.3 cm. lata, apice subabrupte acuminata, acumine obtusiusculo, basi acuta, costa supra impressa; inflorescentia racemosa, ad 2 mm. longa, axillaris; pedicelli fructiferi ad 2.5 mm. longi; bracteolae parvae, ovatae, ca. 1 mm. latae; fructus ellipsoideus, ca. 2 cm. longus, 1.5 cm. diam.; sepala 3–4 mm. lata, 1.5–2.5 mm. longa, rotundata; discus 3.5 mm. diam.

Shrub, about 4 m. high, 5 cm. diam., the branchlets very slender, glabrous in fruiting specimens, compressed below nodes; leaves concolorous, drying green, firmly chartaceous, with traces of short dibrachiate appressed hairs on lower surface at maturity, petiolate, the petioles rather slender, rugose, canaliculate, 4–6 mm. long; leaf blades narrowly elliptic or oblanceolate, 6–8.5 cm. long, 2.5–3.3 cm. wide, apex subabruptly short acuminate, the acumen obtusish, base acute and decurrent on petiole, punctate, the midvein narrowly and sharply impressed above, elevated beneath, the primary lateral veins slender, 9–12 pairs, with intermediaries equally evident on both surfaces, the reticulation rather open; racemes axillary, very short, the axis not over 2 mm. long, evidently only 2- or 4-flowered; fruiting pedicels rather stout, short, up to 2.5 mm.

long; bracteoles (fragments subtending fruits) free, evidently ovate, about 1 mm. wide; fruits ellipsoid, 2 cm. long, 1.5 cm. in diam. (nearly mature), conspicuously glandular, glabrous; sepals persistent, the pairs unequal, depressed-orbicular, 3–4 mm. wide, 1.5–2.5 mm. long, rounded; disk about 3.5 mm. diam., glabrous.

Guatemala: Dept. Baja Verapaz, Union Barrios, on Salama-Coban Road, in high forest on top of hill, about 3 km. west, Feb. 8, 1975, *C. L. Lundell & Elias Contreras 18962* (LL, type), shrub, 12 ft. high, 2 in. diam., fruit brownish.

E. barriosana probably has affinity to *E. bumelioides* Standl. Only traces of short dibrachiate appressed hairs persist on the lower surface of apical leaves, the plant being essentially glabrous in fruit.

Eugenia coffeoides Lundell, sp. nov. – Arbor parva, glabra; ramuli graciles; folia membranacea vel subchartacea, glabra, petiolata, petiolo 3.5–5 mm. longo, canaliculato; lamina anguste elliptica vel lanceolato-elliptica, 5–6.5 cm. longa, 1.5–2.5 cm. lata, apice caudato-acuminata, basi acuta, costa supra anguste canaliculata; inflorescentia axillaris, racemosa, parva; pedicelli fructiferi crassi, 2–3 mm. longi; bracteoiis persistentibus, ca. 0.6 mm. longis, acutis; calycis lobis late ovatis, ad 1.7 mm. latis, 1.2 mm. longis, apice rotundatis, glabris; disco 1.6–2 mm. diam.; fructus ellipsoideus vel ovoideus, ad 1.4 cm. longus, 8 mm. diam.

Tree, about 13 m. high, 20 cm. diam., entirely glabrous at maturity with no trace of pubescence, the branchlets very slender, cracking and occasionally scaly at maturity; leaves thin, membranaceous or subchartaceous, concolorous, petiolate, the petioles 3.5–5 mm. long, slender, shallowly canaliculate; leaf blades narrowly elliptic or lanceolate-elliptic, 5–6.5 cm. long, 1.5–2.5 cm. wide, apex caudate-acuminate, the acumen up to 1.3 cm. long, narrowed to the obtusish apex, base acute, decurrent on petiole, the midvein narrowly but distinctly impressed above to base, elevated beneath, the primary lateral veins 7 or 8 pairs, slender, obscure on both surfaces, anastomosing 1.5–2 mm. from margin, the blade punctate with rather conspicuous pellucid glands; inflorescence axillary, racemose, mostly with 2 to 4 pairs of decussately opposite flowers, the axis short, 3–6 mm. long, about 1 mm. in diameter, 4-angled, scaly; fruiting pedicels short, stout, 2–3 mm. long; bracteoles persistent, small, free, deltoid, about 0.6 mm. long, acutish; fruits ellipsoid, oblong-ellipsoid or ovoid, up to 1.4 cm. long, 8 mm. diam., crowned by the persistent glabrous calyx; calyx lobes suberect, incurved, fleshy, paired, unequal, depressed-ovate, up to 1.7 mm. wide, 1.2 mm. long, rounded at apex; disk 1.6–2 mm. diam., glabrous.

Guatemala: Dept. Baja Verapaz, Union Barrios, on Salama-Coban Road, in high forest on hill, north of km. 148/149, Feb. 7, 1975, *C. L. Lundell & Elias Contreras 18947* (LL, type), tree, 40 ft. high, 8 in. diam., fruit dark red when ripe.

The affinity of *E. coffeoides* appears to be with *E. sasoana* Standl. & Steyerm., differing in its larger caudate-acuminate leaves, shorter racemes, shorter scaly pedicels, and smaller calyx lobes and disk. The fruits suggest ripe coffee berries, whence the name.

Psidium Contrerasii Lundell, sp. nov. — Arbor; ramuli graciles; folia parva, glabra, petiolata, petiolo 2.5–5 mm. longo, canaliculato; lamina membranacea, lanceolata vel ovato-lanceolata, 3–5.5 cm. longa, 1–2 cm. lata, apice caudato-acuminata, basi rotundata et acutiuscula, costa supra impressa; flores axillares, solitarii; pedicelli 8–15 mm. longi; sepala 4, libera, ovato-oblonga, ca. 2 mm. longa, apice rotundata, puberula; petala rotundata, 4–5 mm. longa; ovarium biloculare.

Tree, up to 15 m. high, 20 cm. diam.; branchlets slender, glabrous or with a few small, short, scattered, appressed hairs on new growth; leaves small, glabrous, even the new growth, but with buds having a few short scattered appressed hairs, petiolate, the petioles rather short, 2.5–5 mm. long, slender, canaliculate, glabrous; leaf blades paler beneath, membranaceous, lanceolate or ovate-lanceolate, 3–5.5 cm. long, 1–2 cm. wide, apex caudate-acuminate, base rounded and acutish, the midvein impressed above, elevated beneath, the primary lateral veins about 10 pairs, very slender, shallowly impressed on both surfaces; flowers axillary, usually solitary or superposed, with elongate pedicels 8–15 mm. long; bracteoles deciduous very early, linear, glabrous, up to 5.5 mm. long, 1 mm. wide, narrowed at base into a short petiole; buds pyriform, about 4 mm. long, the hypanthium glabrous, the calyx distinctly 4-lobed, the lobes free nearly to base, ovate-oblong, about 2 mm. long, white pubescent along the rounded apex, and obscurely pubescent within; petals suborbicular, 4–5 mm. long, glabrous; stamens numerous, unequal, up to 4 mm. long; disk and style glabrous, the stigma capitate; ovary 2-celled; young fruits globose, crowned by the 4-lobed calyx.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, west of km. 141/142 of the Peten-Izabal Road, March 12, 1975, *C. L. Lundell & Elias Contreras 19085* (LL, type, fls.), small tree, 45 ft. high, 8 in. diam., flowers white; same locality, *19086* (LL), and *19089* (LL), with young fruits.

With its distinctly 4-lobed calyx, *P. Contrerasii* is related to *P. Molinae* Amshoff of Honduras. That species has densely pubescent branchlets, obtuse smaller leaves, and calyx with 4 very short lobes. The caudate-acuminate leaves, glabrous branchlets, and calyx with large distinct lobes separate *P. Contrerasii.* The tree flowers when the new leaves start to appear. The veins of the leaves are shallowly impressed on both surfaces, an unusual feature of the new taxon.

ARALIACEAE

Dendropanax compactus Lundell, sp. nov. — Frutex glaber, ramulis crassis vel crassiusculis; folia longe petiolata, petiolo canaliculato, 0.8–3 cm. longo; lamina membranacea, anguste oblanceolata vel lineari-oblonga, 7.5–16 cm. longa, 1.2–2.8 cm. lata, apice caudato-acuminata, basi acutiuscula, remote denticulata, minute maculata; inflorescentia terminalis, parva, compacta, 1.5–2 cm. longa; bracteae subulatae; flores petala anguste ovata, ca. 1.3 mm. longa, acutiuscula; stamina ca. 1.8 5-meri; pedicelli crassi, 1.5–3 mm. longi; calyx obconicus, denticulatus; mm. longa; ovarium conicum.

Glabrous shrub, the branchlets rather thick, with cracking scaly surface; leaves petiolate, the petioles slender, canaliculate, 0.8–3 cm. long; leaf blades membranaceous, slightly paler beneath, narrowly oblanceolate or linear-oblong, 7.5–16 cm. long, 1.2–2.8 cm. wide, apex caudate-acuminate, base acutish, the margin irregular and remotely denticulate, minutely reddish-maculate on both surfaces, the midrib elevated above as a narrow ridge, prominent beneath, the primary lateral veins slender, arcuately ascending, 6–8 pairs, openly reticulate; inflorescence terminal reduced, compact, 1.5–2 cm. long, the umbels crowded on short, thick axis, with subulate basal bracts up to 4 mm. long, the peduncles up to 1.7 cm. long, usually with 2 or 3 deltoid, fimbriate bractlets (visible to naked eye); flowers crowded, 5-merous; pedicels thickish, 1.5–3 mm. long; calyx obconic, acutely dentate; petals veiny, narrowly ovate, about 1.3 mm. long, acutish; filaments about 1.5 mm. long; anthers broadly ellipsoid, about 0.5 mm. long, emarginate at base and apex; ovary conical; stigma 4- or 5-lobed.

Guatemala: Dept. Izabal, bordering Rio Cienaga, 3 km. on Rio Dulce Road, in high forest, July 8, 1970, *Elias Contreras 10149* (LL, type), shrub, 7 ft., flowers green.

The specimens under this number came from more than one plant as evidenced by the stage of development of the flowers. Two sheets in the Lundell Herbarium, certainly from the same plant, are designated as type and isotype, both past anthesis and with narrower leaves.

Two collections in fruit from Dolores, Peten, *Contreras 2723* (LL), *2729* (LL) may be referable here. The fruits are small, drying about 4 mm. in diameter.

The greatly reduced compact inflorescences, conspicuous bractlets of the peduncles, and the narrow slender leaves with 6 to 8 pairs of primary lateral veins well-mark *D. compactus* among the populations of this genus in the area.

ERICACEAE

Disterigma mayanum Lundell, sp. nov. – Frutex epiphyticus, ramulis parce hirsutis; folia parva, petiolata, petiolo crasso, 1–1.8 mm. longo, parce hirsuto; lamina coriacea, enervia, apice novella barbata, lanceolato-elliptica vel oblongo-elliptica, 1.2–1.8 cm. longa, 5.2–8 mm. lata, integra, revoluta, apice obtuso-rotundata, basi rotundata, floris glabris axillaribus solitariis; pedicellis ad 1.5 mm. longis, bracteis 2; calycis tubo 4-angulato, 2 mm. longo, lobis 4, ovatis, 2 mm. longis, glabris; corolla alba, glabra, subcylindrica, ca. 11 mm. longa, lobis 4, reflexis, ca. 1 mm. longis; stamina 8; filamenta libera, 7 mm. longa, pilosa; antherae 4 mm. longae; ovarium 4-loculare.

Epiphytic shrub, the branchlets rather slender, stiff, brownish, rather sparsely hirsute, the hairs mostly erect; leaves rather crowded, petiolate, the petioles thick, 1–1.8 mm. long, thick, sparsely hirsute like the branchlets, reddish-brown; leaf blades paler beneath, coriaceous, lanceolate-elliptic or oblong-elliptic, 1.2–1.8 cm. long, 5.2–8 mm. wide, the margin entire, revolute, barbate at apex at first, otherwise glabrous, base rounded, apex obtuse-rounded, the midvein impressed above, plane and obscure

beneath, the lateral veins not evident on either surface; flowers axillary, solitary, 4-parted, the pedicels short, thick, up to 1.5 mm. long, bibracteate at summit, the bracts large, embracing the hypanthium, glabrous; hypanthium articulate, glabrous, 4-angled, fully 2 mm. long; calyx 4-lobed, the lobes ovate, 2 mm. long, acutish, glabrous; corolla glabrous, subcylindric, expanded above, about 11 mm. long, the four lobes deltoid, 1 mm. long, acutish, reflexed at anthesis; stamens 8, equal, free; filaments 7 mm. long, narrowly ligulate, pilose to below the middle; anthers subbasifixed, 4 mm. long, the tubule about 2.5 mm. long, dehiscing by narrow introrse clefts; style filiform, about 11 mm. long, the stigma truncate; ovary 4-celled, with central placenta and numerous ovules; disc annular, carnose.

Guatemala: Dept. Baja Verapaz, Union Barrios, on Salama-Coban Road, in high forest on hill, pineland, about 2.4 km. west, Feb. 6, 1975, *C. L. Lundell & Elias Contreras 18936* (LL, type), epiphytic shrub, flowers white.

D. Humboldtii (Klotzsch) Niedenzu, the only species reported from Guatemala, has glabrous leaves and corolla only 6–7 mm. long.

The leaves of *D. mayanum* with veins not evident and barbate apically at first, along with the comparatively large corolla, are distinctive. It is an epiphytic shrub, the only other species of this habit is *D. Humboldtii*.

Vaccinium quicheanum Lundell, sp. nov. — Frutex, ramulis rubris, dense puberulis, dense foliatis; folia coriacea, breviter petiolata, petiolo crasso, 3–6 mm. longo, minute puberulo; lamina novella parce puberula, glabrata, lanceolata vel anguste elliptica, 3–8.5 cm. longa, 1.5–4 cm. lata, apice late obtusa vel obtusa, basi acuta, obtusa vel rotundata, remote et subobsolete adpresso-crenulata, costa utrinque crassa, prominula, nervis lateralibus utrinque prominulis, reticulatis; racemi axillares brevissimi multiflori puberuli, pedicellis rubris, 3–7 mm. longis, bibracteatis; hypanthium ca. 1.5 mm. longum, breviter pilosulum; sepala 5, anguste triangulari-acuminata, 1–1.3 mm. longa, breviter pilosa; corolla subcylindrica, 3–4 mm. diam., 9–10 mm. longa, extus pilosa, lobis 5, 2 mm. longis, acutis; stamina 10, ca. 10 mm. longa; filamenta ca. 5 mm. longa, pilosa; antherae minute echinatae; ovarium 10-loculare.

Shrub, up to 3.5 m. high, the branchlets rather slender, reddish, densely puberulent with fine incurved whitish hairs, the internodes short, the leaves crowded, petiolate, the petioles thick, reddish, 3–6 mm. long, puberulent like the branchlets; leaf blades rigidly coriaceous, at first puberulent with fine incurved hairs, glabrous early except along the midvein, lanceolate or narrowly elliptic, 3–8.5 cm. long, 1.5–4 cm. wide, apex broadly obtuse or obtuse, base acute, obtuse or rounded, remotely and rather obscurely crenulate with the small teeth appressed, the midvein thick, convex on both surfaces, the primary lateral veins mostly 3 or 4 pairs, strongly ascending from below middle of blade, sometimes the nerves 5 or 6 pairs, and more regularly spaced, well developed on both surfaces, the veins reticulate and rather conspicuous; racemes axillary, the axis usually short, sometimes up to 1 cm. long, red, puberulent with fine white incurved hairs, each pedicel subtended by subulate

persistent bract; pedicels slender, 3–7 mm. long, with two subulate bractlets; hypanthium about 1.5 mm. long, puberulent; calyx 2 mm. long, puberulent, the sepals 5, united below, triangular, acute, 1–1.3 mm. long; corolla subcylindric, slightly expanded distally, 9–10 mm. long, 3–4 mm. in diameter distally, narrower at base, conspicuously short pilose outside, glabrous within, the 5 lobes 2 mm. long, oblong-lanceolate, acutish, reflexed apically at anthesis; stamens 10, equalling the corolla, free, the filaments slender, about 5 mm. long, pilose; anthers 2 mm. long, minutely echinate, caudate at base, with 2 slender tubules about 3 mm. long; disc annular, carnose; style slender, glabrous, about 1 cm. long; stigma truncate; ovary 10-celled.

Guatemala: Dept. El Quiche, Nebaj, alt. 8000 ft., in pineland, June 13, 1964, *Elias Contreras 4983* (LL, type), *4981* (LL), shrub, flowers pinkish.

V. haematinum Standl. & Steyerm. probably is related to *V. quicheanum*, but differs at once in its smaller glabrous flowers with corolla described as 6 mm. long (Fieldiana: Bot. 24, part VIII: 123. 1966). *V. minarum* Standl. & Steyerm., also of this affinity, is described as having corolla only 6 mm. long, and its leaves are quite different.

Vaccinium Tolbertianum Lundell, sp. nov. – Frutex, ramulis glabris vel raro glanduloso-stipitatis; folia glabra, rigide coriacea, petiolata, petiolo crasso, 5–10 mm. longo; lamina denticulato-crenulata, nervosa, ovata, 5–8 cm. longa, 2.5-4.3 cm. lata, apice acuta vel acuminata, basi rotundata; inflorescentia axillaris, racemoso-paniculata, glabra, rubra, ad 4.5 cm. longa, 5 cm. lata; pedicelli fructiferi 5–8 mm. longi; fructus subglobosus; ovarium 10-loculare.

Small shrub, young branchlets reddish, rather slender, zigzag, glabrous at first, the older branchlets sometimes with conspicious erect rigid gland-tipped hairs, these hairs enlarged at base, some gland-tipped hairs present at times on petioles and at base on lower surface of mature leaves; leaves firmly coriaceous, rigid, glabrous except as noted above, petiolate, the petioles thick, 5–10 mm. long, blackened with age, rugose; leaf blades ovate, 5–8 cm. long, 2.5–4.3 cm. wide, apex acute or acuminate, base rounded, somewhat paler beneath, the margin rather remotely denticulate-crenulate, with slender teeth breaking off early, the midvein and primary lateral veins impressed above, conspicuously elevated beneath, the primary lateral veins 5–7 pairs, arcuately ascending, coarsely reticulate; inflorescence axillary, the flowers in racemiform panicles, up to 4.5 cm. long, 5 cm. wide, the panicles usually consisting of 2 or 3 slender racemes, each node of raceme subtended by persistent deltoid acuminate bract about 1 mm. long, the inflorescence reddish, glabrous, drying angled; pedicels slender, 5–8 mm. long, with pair of acuminate bractlets near the middle; immature fruit bright red, drying rugose, subglobose, about 4 mm. in diam., crowned by the persistent style; lobes 5, deltoid, sharply acuminate, ca. 1 mm. long, inflexed; ovary 10-celled.

Guatemala: Dept. El Quiche, El Boqueron, in mossy secondary thickets, alt. 8000–8200 ft., Aug. 10, 1964, *George R. Proctor 25479* (LL, type), small shrub.

Only immature fruits are available. The elongate racemes in panicles, the rigidly coriaceous conspicuously nerved leaves, together with the peculiar rigid gland-tipped hairs at the leafy base of one of the branchlets, well-mark the taxon. Its affinity is to the species with elongated racemes which includes *V. leucanthum* Cham. & Schlecht. of the same region.

The species is named for Mr. Frank X. Tolbert, my genial and hard working field associate on the botanical-archaeological expedition to Tikal and Uaxactun, Guatemala in 1960. Mr. Tolbert, the noted columnist of The Dallas Morning News, historian and author of various books on the Southwest, has a fine curiosity about plants, their names and uses. As a splendid example, the "farkleberry," *Vaccinium arboreum* Marsh., a common wild blueberry species of the southern United States, including eastern and central Texas, has gained national attention from his writings.

It is an honor to name a mountain "farkleberry" of Guatemala, *Vaccinium Tolbertianum*.

MYRSINACEAE

Ardisia izabalana Lundell, sp. nov. — Frutex vel arbor parva; ramuli crassiusculi, minute glandulo-puberuli; folia chartacea, petiolata, petiolo canaliculato, anguste marginato, 1.2–2 cm. longo, supra glandulo-puberulo; lamina anguste oblonga vel oblongo-elliptica, raro lanceolata vel oblanceolata, (5.5–) 9.5–14 cm. longa, (2.2–) 3.5–5.2 cm. lata, apice acuta, obtusa vel subacuminata, basi acutiuscula, integra; inflorescentia late paniculata, 11–20 cm. lata, 12–15 cm. longa, minute et parce glandulo-puberula; flores subcorymbosi; pedicelli fructiferi crassiusculi, 3–5 mm. longi; sepala 5, ovato-elliptica, 2 mm. longa, ciliata, punctata; fructus globosus, 7–9 mm. diam.

Shrub or small tree, up to 8 m. tall, 10 cm. diam., the branchlets rather thick, pale, grayish, minutely glandular-puberulent with reddish hairs; leaves firmly chartaceous, glabrous above, the petioles and blades rather sparsely and minutely glandular-puberulent beneath at first, glabrous at maturity, the petioles deeply canaliculate to base, narrowly marginate, 1.2–2 cm. long; leaf blades narrowly oblong or oblong-elliptic, sometimes lanceolate or oblanceolate, reduced at base of inflorescence, (5.5–) 9.5–14 cm. long, (2.2–) 3.5–5.2 cm. wide, apex acute, obtuse or subacuminate, base acutish and decurrent, margin entire, costa impressed above, elevated beneath, primary lateral veins 10–12 pairs, slender, arcuately ascending, less evident above; inflorescence terminal, paniculate, large, open, broadly pyramidal, 11–20 cm. wide at base, 12–15 cm. long, minutely glandular-puberulent with reddish hairs, the indument not dense, the panicle essentially sessile with reduced leaves subtending lower branches; flowers subcorymbose; pedicels thick, 3–5 mm. long; sepals 5, ovate-elliptic, fully 2 mm. long, ciliate, punctate with small reddish-black glands, the glands rather widely distributed, those of medial section largest; fruits globose, 7–9 mm. diam.; purple-black at maturity.

Guatemala: Dept. Izabal, El Estor, in high forest on a hill, 6 km. south, Jan. 30, 1975, *C. L. Lundell & Elias Contreras 18898* (LL, type), shrub or small tree, 25 ft. tall, 4 in. diam., fruit black.

A. izabalana is related to *A. Schippii* Standl. of the same area. It differs in its narrow, mostly oblong, entire, less prominently veined leaves, sparser minute glandular pubescence, and shorter pedicels.

Gentlea parviflora Lundell, sp. nov. – Frutex, ramulis juventate minute et dense rufo-lepidotis; folia petiolata, petiolo marginato, canaliculato, 4–6 mm. longo; lamina membranacea, glabra, oblanceolata vel anguste elliptica, 3–8.5 cm. longa, 1.2–3 cm. lata, apice acuminata, basi acuta; inflorescentia terminalis, parva, ad 1.5 cm. longa, paniculata, pauciflora; pedicelli 2.5–5 mm. longi; flores 5- vel 6-meri; sepala ovata, 1–1.3 mm. longa, lepidota, aurantiaco-punctata; corolla gamopetala, 2.5–2.8 mm. longa, lobis lepidotis; stamina 3.5–4 mm. longa; ovarium glabrum; stylus 3–3.5 mm. longus; fructus subglobosus, 3–4.5 mm. diam.

Shrub, about 7 m. tall, 7.5 cm. diam., the branchlets rather short and slender, at first very minutely and densely rufous-lepidote, appearing to be glabrous; leaf buds closely appressed lepidote; leaves small, deep green above, slightly paler beneath, essentially glabrous, the petioles sparsely and very minutely lepidote, slender, 4–6 mm. long, canaliculate, marginate to base, the edges thin; leaf blades membranaceous, oblanceolate or narrowly elliptic, 3–8.5 cm. long, 1.2–3 cm. wide, apex acuminate, the acumen obtusish, base revolute, decurrent on petiole, acute, the midvein sharply impressed above, elevated beneath, the primary lateral veins 12–15 pairs, irregular, rather obscure, arcuately ascending and anastomosing one-fourth to one-third of distance from margin; inflorescence terminal, very small, sessile, paniculate, minutely lepidote at first, glabrate, the rachis 5–15 mm. long, stout; pedicels 2.5–5 mm. long, stout; flowers 5- or 6-parted, dense; sepals ovate, 1–1.3 mm. long, apically punctate with small orange glands, minutely lepidote, the margin hyaline and erose; corolla gamopetalous, 2.5–2.8 mm. long, the lobes narrowly oblong-lanceolate, acutish, lepidote; stamens exserted, 3.5–4 mm. long, with small ovate anthers; ovary glabrous; style 3–3.5 mm. long; fruits bright red, subglobose, 3–4.5 mm. diam.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, on top of hill, east of km. 154, April 11, 1975, *C. L. Lundell & Elias Contreras 19212* (LL, type), arborescent scrub, 20 ft. tall., 3 in. diam., flowers greenish-white; also, same area, *Lundell & Contreras 18952* (LL, fruits), *19220* (LL, flowers).

The small inflorescence with rachis 0.5–1.5 cm. long, the membranaceous leaves, and very small flowers set the species apart from all others in the genus. *G. parviflora* is nearest *G. Austin-Smithii* (Lundell) Lundell which is known only from Costa Rica and Panama. That taxon has flowers with sepals up to 2 mm. long and corolla 3–4.2 mm. long.

SAPOTACEAE

Bumelia Contrerasii Lundell, sp. nov. – Arbor glabra, ad 26 m. alta, 45 cm. diam.; ramuli graciles; folia glabra, petiolata, petiolo marginato, 6–15 mm. longo; lamina subchartacea, obovata vel oblanceolata, 10–17 cm. longa, 4.5–7.4 cm. lata, apice obtusa, basi acuta; flores fasciculati;

pedicelli graciles, 3.5–7 mm. longi; sepala 5 vel 6, imbricata, 2 exteriora glabra, interiora minute sericea, suborbicularia, 3 mm. longa; corolla glabra, 5–5.5 mm. longa; filamenta crassa, ad 3 mm. longa; antherae lanceolato-oblongae, ca. 1.7 mm. longae; staminodia ovato-lanceolata, ca. 3 mm. longa, erosa, laciniata; ovarium glabrum, 5- vel 6-costata, 5- vel 6-loculare; stylus crassus, ca. 3 mm. longus.

Large tree, up to 26 m. tall, 45 cm. diam., entirely glabrous, the branchlets drying bright green, rather slender; leaves glabrous, petiolate, the petioles rather short, narrowly marginate, 6–15 mm. long; leaf blades thin, subchartaceous, obovate or oblanceolate, 10–17 cm. long, 4.5–7.4 cm. wide, apex broadly obtuse or sometimes rounded, base acute, decurrent on petiole, the midvein broad and nearly plane above, elevated beneath, primary lateral veins 7–9 pairs, slender but prominent beneath, conspicuous above, the reticulation open, slightly paler beneath; flowers fasciculate in the leaf axils or at defoliated nodes, numerous; pedicels glabrous, slender, 3.5–7 mm. long; sepals 5 or 6, imbricate, fleshy, rugose at base, suborbicular, fully 3 mm. long, rounded at apex, cucullate, the two outer strictly glabrous, the inner finely sericeous; corolla glabrous, 5–5.5 mm. long, lobed to the middle, the lobes ellipsoid, cucullate, rounded at apex, with narrow lanceolate appendages with erose margins, laciniate, acuminate, shorter than the lobes; filaments attached at or about the level of the sinuses, stout, up to 3 mm. long; anthers versatile, lanceolate-oblong, about 1.7 mm. long; staminodes petaloid, thin, ovate-lanceolate, about 3 mm. long, erose, laciniate; ovary glabrous, 5- or 6-ribbed, 5- or 6-loculate, with a single ovule in each locule; style thick, narrowly conical, about 3 mm. long, the stigma punctiform.

Guatemala: Dept. Izabal, on the Peten-Guatemala Road, in high forest, *corozal*, between Seja and Cienaga, May 4, 1971, *Elias Contreras 10722* (LL, type), tree, 80 ft. high, 18 in. diam., flowers greenish-white; same locality and date, *Contreras 10721* (LL), tree, 60 ft. high, 15 in. diam., flowers greenish-white; same locality and date, *Contreras 10723* (LL), tree, 40 ft. high, 12 in. diam., flowers greenish-white.

B. Contrerasii has affinity to *B. Matudae* (Lundell) Stearn, differing in its strictly glabrous branchlets and leaves, and in its larger calyx with inner sepals finely sericeous on outer surface. The branchlets dry green, and even the apical leaf buds are glabrous. The sepals are nearly equal, the outer being only slightly shorter.

Bumelia neglecta (Cronquist) Lundell, comb. nov. *Bumelia retusa* Swartz subsp. *neglecta* Cronquist, Jour. Arnold Arb. 26:461. 1945. *Bumelia americana* (Miller) Stearn subsp. *neglecta* (Cronquist) Stearn, Jour. Arnold Arb. 40:284. 1968.

Mexico: Yucatan, Progreso, in scrub on low sand dunes, July 1938, *C. L. & Amelia A. Lundell 7392* (LL, flowers & fruits), spinescent shrub, 3–6 ft. high, ripe fruits globose, black.

Based on a study of collections of *B. retusa* Swartz [*B. americana* (Miller) Stearn] from Jamaica, I have concluded that the mainland shrub should be recognized as a distinct species.

Bumelia durangensis Lundell, sp. nov. — Arbor, ca. 13 m. alta, 30 cm.

diam., ramulis novellis rufo-tomentosis; folia novella subtus rufo-tomentosa, petiolata, petiolo 4–7 mm. longo; lamina subcoriacea, ovalia vel ovato-elliptica, 4–6.5 cm. longa, 2.5–3.5 cm. lata, apice rotundata vel obtusa, basi rotundata; flores fasciculati; pedicelli fructiferi 3–4.5 mm. longi; sepala 5, ovato-elliptica, 3–3.5 mm. longa, apice rotundata, extus rufo-sericea; corolla glabra, 4–5 mm. longa; staminodia glabra, erecta, integra, 3–3.5 mm. longa; antherae ca. 1.8 mm. longae; ovarium glabrum; drupa ca. 1 cm. longa, ellipsoidea.

Tree, about 13 m. high, 30 cm. diam., the branchlets rather slender, tomentose at first with reddish branched hairs, glabrate; leaves and petioles tomentose on lower surface with reddish branched hairs, glabrate early except along the midvein, the petioles slender, 4–7 mm. long, canaliculate; leaf blades firm, subcoriaceous, oval or ovate-elliptic, usually widest at the middle, 4–6.5 cm. long, 2.5–3.5 cm. wide, apex rounded or obtuse, base rounded, only slightly paler beneath, the midvein elevated on lower surface, with a narrow ridge on upper surface, the primary lateral nerves 9–11 pairs, with intermediaries, the reticulation open and rather inconspicuous on both surfaces; flowers fasciculate in the leaf axils; pedicels stout, 3–4.5 mm. long, glabrate; sepals 5, firm, imbricate, ovate-elliptic, 3–3.5 mm. long, apex rounded, pubescent with fine reddish appressed hairs; corolla glabrous, 4–5 mm. long, the narrow tube 1–1.5 mm. long, the lobes suberect, with narrow lateral lobes on each side, the staminodia glabrous, petaloid, 3–3.4 mm. long, equalling corolla lobes, apparently entire; anthers about 1.8 mm. long; ovary glabrous, the style 5.5 mm. long; immature fruits ellipsoid, up to 1 cm. long.

Mexico: Durango, edge of Rio Piaxtla, near Guarisame, April 9, 1943, *C. L. Lundell 13000* (LL, type; MICH, isotype), tree, 12 in. diam., 40 ft. high, fruits edible, "*cupilla*."

Related apparently to *B. cartilaginea* Cronquist, it differs in having reddish tomentose branchlets and leaves, the hairs stipitate and branched or dibrachiate, and larger leaves. *B. cartilaginea* is described as having reddish sericeous-strigose branchlets and leaves only 8–22 mm. wide. The type is a fruiting specimen, and only fragments of the flowers persist. The staminodia equal the corolla lobes in *B. durangensis* and they appear to be entire and erect, not cucullate and erose-laciniate as in *B. cartilaginea*. The peculiar stalked, branched hairs of *B. durangensis* are distinctive.

Bumelia sebolana Lundell, sp. nov. – Arbor parva, ramulis glabris; folia glabra, petiolata, petiolo 5–10 mm. longo; lamina oblanceolato-oblonga, obovata vel oblongo-elliptica (5–) 7–11 cm. longa, 2.3–4.5 cm. lata, apice abrupte caudato-acuminata, basi acutiuscula; flores 5-meri, ad axillam foliorum singuli dispositi vel 2-fasciculati; pedicelli fructiferi ad 1.5 cm. longi; calyx basi rugosus, lobus late ovatus, imbricatus, 1.7–2 mm. longus, 1.7–2.4 mm. latus, apice obtuso-rotundatus; ovarium 5-loculare; stigma 5-lobata; bacca ellipsoidea, ad 2.4 cm. longa; semina 1; cotyledones crassae.

Small tree, 5 m. high, 5 cm. diam., the branchlets slender, terete, glabrous, the leaf buds with appressed reddish hairs, leaves very thin, parchment-like, glabrous, petiolate, the petioles slender, canaliculate,

5–10 mm. long; leaf blades oblanceolate-oblong, obovate or oblong-elliptic, (5–) 7–11 cm. long, 2.3–4.5 cm. wide, apex abruptly caudate-acuminate, base acutish, margin obscurely crenulate, midvein impressed above, elevated beneath, the primary lateral veins very slender, widely ascending and anastomosing near margin, 18–24 pairs, obscure above; flowers in pairs in leaf axils; pedicels of flowers (past anthesis) about 7 mm. long, with traces of reddish appressed pubescence, the pedicels accrescent, rigid but slender, in fruit up to 1.5 cm. long, mostly solitary in fruit; calyx fleshy, rugose at base, deeply 5-parted, with traces of reddish appressed hairs, the lobes fleshy, broadly ovate, subequal, imbricate, 1.7–2 mm. long, 1.7–2.4 mm wide, apex obtuse-rounded, glabrous within, subciliate, the inner sepal thinner; corolla not seen; ovary depressed-globose, pubescent with reddish appressed hairs; style slender-conical, obscurely ribbed below, pubescent like the ovary below middle, glabrous above, 3.5–4 mm. long; stigma capitate, distinctly 5-lobed; ovary 5-celled, with 1 basilateral ovule in each cell; fruits pubescent at base, ellipsoid, 1-seeded, up to 2.4 cm. long, reddish when ripe, the pericarp leathery, rather thin, the style persistent; seed smooth, shiny, with conspicuous ellipsoid basilateral seed-scar extending from base almost to middle; testa of seed thin and brittle, brown.

Guatemala: Dept. Alta Verapaz, Sebol, in high forest on top of a hill, about 5 km. on old Peten Road, April 18, 1964, *Elias Contreras 4411* (LL, type), tree, 15 ft., 2 in. diam.

Past anthesis, no corolla is available, but the generic position is obvious on the basis of seed characteristics. With its mostly geminate axillary flowers with accrescent pedicels up to 1.5 cm. long, and striking thin parchment-like glabrous leaves, widest above middle and abruptly caudate-acuminate, *B. sebolona* can not be confused with any other sapotaceous species of the Maya area. Its leaves resemble those of *Sebastiania Standleyana* Lundell of the Euphorbiaceae.

Mastichodendron Gaumeri (Pittier) Lundell, comb. nov. *Sideroxylon Gaumeri* Pittier, Contr. U. S. Nat. Herb. 13: 460. 1912. *Mastichodendron foetidissimum* (Jacq.) Cronquist subsp. *Gaumeri* (Pittier) Cronquist, Lloydia 9: 248. 1946. *Mastichodendron foetidissimum* (Jacq.) Cronquist var. *Gaumeri* (Pittier) L. Wms., Fieldiana: Bot. 31: 263. 1967.

Micropholis guatemalensis Lundell, sp. nov. — Arbor, ad 32 m. alta, 65 cm. diam., ramulis novellis minute rufo-sericeis; folia dense striata, petiolata, petiolo canaliculato, 7–13 mm. longo; lamina subcoriacea, oblanceolata, oblonga vel oblongo-elliptica, 7–11 cm. longa, 2.8–4.5 cm. lata, apice abrupte subacuminata, basi late cuneata, acuta; flores fasciculati; pedicelli crassi, rufo-sericei, 2.5–4 mm. longi; sepala 5, coriacea, extus minute rufo-sericea, ovato-elliptica vel elliptica, 3–3.2 mm. longa, ad 2.2 mm. lata, apice rotundata, intus glabra; corolla glabra, 3.5–4 mm. longa, lobis apice truncatis; filamenta 1–1.5 mm. longa; antherae ovatae, ca. 0.6 mm. longae, apiculatae; staminodia anguste lanceolata, ad 1.5 mm. longa, apiculata; ovarium hirsutum, 5-loculare; stylus crassus, 2.5–3 mm. longus.

Large tree, up to 32 m. tall, 65 cm. diam., the branchlets rather short,

pubescent at first with closely appressed reddish hairs; leaf buds pubescent with reddish appressed hairs; leaves with midvein and petioles with traces of appressed pubescence at maturity, the petioles slender, canaliculate, 7–13 mm. long; leaf blades subcoriaceous, slightly paler beneath, oblanceolate, oblong or oblong-elliptic, 7–11 cm. long, 2.8–4.5 cm. wide, apex abruptly short acuminate or obtuse, the acumen usually obtuse and emarginate, base broadly cuneate, acute, the midvein grooved above and usually with a narrow medial elevated ridge, wide and conspicuous beneath, finely striate, the lateral nerves mostly 0.2–0.3 mm. apart; flowers numerous and densely fasciculate in the leaf axils or at defoliated nodes, the stout pedicels 2.5–4 mm. long, pubescent with appressed reddish hairs like the calyx; sepals 5, subequal, coriaceous, ovate-elliptic or elliptic, 3–3.2 mm. long, up to 2.2 mm. wide, rounded at apex, glabrous within; corolla glabrous, tubular, 3.5–4 mm. long, lobed to about the middle, the lobes ovate-elliptic, broadly truncate and recurved at apex; filaments attached near the middle of corolla tube, very slender, 1–1.5 mm. long; anthers small, basifixed, ovate, about 0.6 mm. long, apiculate; staminodia thin, narrowly lanceolate, up to 1.5 mm. long, apiculate, shorter than corolla lobes; ovary hirsute, truncate, 5-loculate; style stout, 2.5–3 mm. long.

Guatemala: Dept. Izabal, in high forest, *corozal*, between Cienaga and Seja, Rio Dulce Road, May 4, 1971, *Elias Contreras 10713* (LL, type), tree, 100 ft. high, 25 in. diam., flowers greenish-white, "*zapotillo*"; same locality, May 5, 1971, *Contreras 10732* (LL), tree, 80 ft. high, 18 in. diam., flowers greenish-white, "*zapotillo.*"

M. guatemalensis has finely striate leaves like *M. rugosa* (Sw.) Pierre of Jamaica. It differs from that species in its smaller leaves widest above middle, flowers densely aggregated in leaf axils, short stout pedicels not over 4 mm. long, larger sepals glabrous within, glabrous corolla, slender filaments up to 1.5 mm. long attached at the middle of the corolla tube, and longer staminodes up to 1.5 mm. long. *M. mexicana* Gilly ex Cronquist, which I originally described from the mountains of Chiapas, has much larger flowers, longer slender pedicels up to 8 mm. long, and filaments attached at or a little above the level of the sinuses of the corolla.

Micropholis mexicana Gilly ex Cronquist, Lloydia 9: 257. 1946. *Sideroxylon calophylloides* Lundell, Contr. Univ. Mich. Herb. 6: 56. 1941, non *M. calophylloides* Pierre. *Pouteria calophylloides* (Lundell) Lundell, Wrightia 5: 6. 1972.

This taxon was included in the *Flora of Guatemala* (Fieldiana: Bot. 24, part VIII: 232. 1967), but I have not seen the specimens on which the report is based. It is probable that *M. guatemalensis* is the only species in Guatemala.

Pouteria areolatifolia Lundell, sp. nov. – Arbor, ad 40 m. alta, 90 cm. diam., ramulis crassis, novellis rufo-tomentosis; folia rigide coriacea, glabra, petiolata, petiolo canaliculato, 1–2.5 cm. longo; lamina subbullata, oblonga, oblongo-elliptica vel raro oblanceolata, 7–12.5 cm. longa, 2.7–5 cm. lata, apice subacuminata vel obtusa, basi acutiuscula, utrinque

areolata; pedicelli fructiferi nulli; sepala rufo-tomentosa, rotundata vel late ovato-rotundata, 1–2.5 mm. longa, ad 3.5 mm. lata, intus sericea; bacca globosa, ca. 3 cm. diam., rufo-tomentosa; semina 1; area derasa longitudine seminis.

Tree, up to 40 m. tall, 90 cm. diam., branchlets usually thick, red-tomentose, glabrous with age; leaves firmly coriaceous, glabrous at maturity, petiolate, the petioles slender, canaliculate, 1–2.5 cm. long, drying blackish; leaf blades scarcely paler beneath, oblong, oblong-elliptic or sometimes oblanceolate, 7–12.5 cm. long, 2.7–5 cm. wide, apex subacuminate or obtuse, base acutish, costa prominent beneath, nearly plane above, primary veins 10–14 pairs, broadly ascending, slender, elevated and conspicuous beneath, slightly impressed above, areolate on both surfaces; fruits sessile, at defoliated nodes, sometimes borne on short lateral branches; sepals red-tomentose, depressed-orbicular or broadly ovate-rounded, 1–2.5 mm. long, up to 3.5 mm. wide, sericeous within; immature fruits globose, sessile, up to 3 cm. in diam., tomentose with fine matted red hairs, the pericarp hard, 3.5–4 mm. thick; 1-seeded, the seed coat thin, the seed-scar lateral, large, extending the whole length of seed; endosperm apparently absent.

Guatemala: Dept. Peten, La Cumbre, on Cadenas Road, west of km. 114, in high forest, August 2, 1969, *Elias Contreras 8835* (LL, type), tree, 120 ft. high, 35 in. diam., fruit brownish.

The leaves are rigidly coriaceous, subbullate above, and with prominent lateral veins. The red-tomentose sessile globose fruits are distinctive. Only fragments of the calyx persist, but the sepals are small and sericeous within. Until flowers become available, the relationship of *P. areolatifolia* can not be ascertained.

Pouteria binatosepala Lundell, sp. nov. — Arbor; ramuli graciles; folia glabra, petiolata, petiolo canaliculato, 1–2 cm. longo; lamina subcoriacea, oblongo-elliptica, elliptica vel lanceolata, 7.5–12 cm. longa, 2.5–5 cm. lata, apice acuminata, basi acuta, utrinque areolata; flores 4-meri, fasciculati; pedicelli crassi, subnulli, rufo-tomentosi; sepala 4, biseriata, 2 exteriora coriacea, ovata, 2.4–2.75 mm. longa, utrinque sericea, 2 interiora elliptica, ad 3.2 mm. longa, ciliata, extus glabra, intus sericea; corolla urceolata, glabra, 3 mm. longa, lobis 4, late ovatis, ca. 1.2 mm. longis; filamenta ca. 0.5 mm. longa; antherae lanceolato-ovatae, ca. 1 mm. longae, apiculatae; staminodia 4, lanceolata, crassiuscula, parva; ovarium hirsutum, 4-loculare; stylus crassus, ca. 2 mm. longus.

Tree, 23 m. high, 45 cm. diam., the branchlets rather slender, stiff, glabrate, the flower buds and inflorescence rufous-pubescent; leaves glabrous at maturity, shiny above, pale beneath, petiolate, the petioles slender, canaliculate, 1–2 cm. long, blackish with age; leaf blades subcoriaceous, oblong-elliptic, elliptic or lanceolate, 7.5–12 cm. long, 2.5–5 cm. wide, apex short acuminate, base acute, decurrent on petiole, the midvein large and elevated beneath, nearly plane above, narrow low medial ridge evident, the primary lateral veins slender, 16–20 pairs, nearly straight, reticulate-veined, areolate on both surfaces, the margin slightly thickened; flowers fasciculate and crowded in the leaf axils and

at defoliated nodes, sometimes borne on short rufous-pubescent axillary branchlets not over 1 cm. long with glomerules of flowers at nodes; flowers 4-parted, subsessile, the stout pedicels less than 1 mm. long, rufous-pubescent; sepals 4, biseriate, unequal, the outer 2 ovate, 2.4–2.75 mm. long, coriaceous, rather thinly appressed pubescent on outside, sericeous within, the 2 inner sepals elliptic, up to 3.2 mm. long, thinner, glabrous outside, ciliate, sericeous within; corolla urceolate, only slightly exserted, glabrous, reddish inside below, 3 mm. long, 4-lobed, the lobes short, depressed-ovate, about 1.2 mm. long, the apex rounded, obscurely apiculate, the exserted tip reflexed; filaments attached at or about the level of sinuses of lobes, introrsely curved, sometimes at right angle, about 0.5 mm. long, slender; anthers basifixed, lanceolate-ovate, about 1 mm. long, apiculate; staminodia 4, lanceolate, thickish, shorter than corolla lobes; ovary hirsute, 4-loculate, the ovules laterally attached; style thick, about 2 mm. long.

Guatemala: Dept. Peten, Dos Lagunas, on Arroyo Seco, 1 km. south of El Cedro, in high forest, *zapotal*, May 3, 1969, *Elias Contreras 8456* (LL, type), tree, 70 ft. high, 18 in. diam., flowers greenish-white, "*silion*."

P. binatosepala has strictly 4-parted flowers with unequal biseriate sepals.

Pouteria dibrachiata Lundell, sp. nov. – Arbor parva, ramulis pilis rufis appressis minimis, dibrachiatis, obsita; folia petiolata, petiolo canaliculato, 8–15 mm. longo; lamina membranacea, glabrata, elliptico-oblonga, elliptica vel oblanceolata, 14–26 cm. longa, 4.3–8.5 cm. lata, apice acuminata, basi acuta; flores 5-meri, fasciculati; pedicelli 3–4 mm. longi; sepala imbricata, late ovato-elliptica, 3–4 mm. longa, apice rotundata; corolla glabra, urceolata, ca. 4.3 mm. longa, lobis ciliolatis, ca. 1.3 mm. longis; filamenta ca. 1.5 mm. longa; antherae ovatae, ca. 1 mm. longae, apiculatae; staminodia nulla; ovarium hirsutum, 5-loculare; stylus crassus, conicus, ca. 3 mm. longus.

Small tree, the leaf buds and tips of branchlets densely appressed pubescent at first with small red dibrachiate hairs, glabrate; leaves large, with petioles and midvein beneath appressed pubescent at first with dibrachiate hairs, glabrous at maturity, the petioles slender, canaliculate, 8–15 mm. long; leaf blades thin, membranaceous, elliptic-oblong, elliptic or oblanceolate, 14–26 cm. long, 4.3–8.5 cm. wide, apex acuminate, base acute, decurrent on petiole, midvein elevated beneath, impressed above, the primary lateral veins slender, arcuately ascending, 8–11 pairs, conspicuous on lower surface, less evident above, openly reticulate; flowers few, 5-parted, fasciculate in leaf axils or at defoliated nodes; pedicels rather slender, 3–4 mm. long, sericeous with small dibrachiate hairs; sepals 5, imbricate, unequal, the outer sparingly sericeous with minute hairs, the inner glabrous, broadly ovate-elliptic, 3–4 mm. long, rounded at apex; corolla glabrous, urceolate, about 4.3 mm. long, shallowly 5-lobed, the ovate-orbicular lobes minutely ciliolate, about 1.3 mm. long, without lateral lobes; filaments attached 0.4–0.75 mm. above base of the urceolate corolla tube, the filaments stout, about 1.5 mm. long; anthers basifixed, ovate, about 1 mm. long, apiculate; staminodia none; ovary

hirsute, 5-loculate, the ovules attached laterally; style thick, conical, about 3 mm. long, the stigma truncate.

Costa Rica: Heredia, Tirimbina, in tropical wet forest, elev. 700 ft., May 31, 1971, *George R. Proctor 32205* (LL, type), small tree, flowers cream, "*sapotilla*."

From description *P. dibrachiata* must resemble *P. lucentifolia* (Standl.) Baehni of Costa Rica. The latter has been known only from a fruiting specimen. The larger sepals and shorter petioles of *P. dibrachiata* are to be noted.

It is significant that the lobes of the urceolate corolla of *P. dibrachiata* are quite short, and that the stout filaments are attached near the base of the tube. The absense of staminodia is unusual, but reported before in the genus.

Pouteria Durlandii (Standl.) Baehni, Candollea 9: 422. 1942. *Lucuma Durlandii* Standl., Trop. Woods 4: 5. 1925. *Paralabatia Durlandii* (Standl.) Aubr., Adansonia, new ser. 3: 21. 1963.

Tree, usually small to medium sized, sometimes up to 20 m. tall, 45 cm. diam.; branchlets lenticellate, stout, at first densely pubescent with rufous closely appressed dibrachiate hairs, these persistent, at length glabrous or nearly so; tender young leaves of new growth densely rufous-sericeous on upper surface, less so beneath; mature leaves glabrous, coriaceous, with stout blackened petioles 1–2.5 cm. long, subterete or flattened above; leaf blades mostly oblanceolate or obovate, sometimes narrowly elliptic or elliptic, 10–15 (–30) cm. long, 3.5–7 (–11) cm. wide, the margin undulate, often irregular, apex usually subabruptly acuminate, the acumen up to 2 cm. long, acute, the primary lateral veins mostly 9–11 pairs, widely ascending and uniformly spaced, slender but elevated on lower surface, evident but less conspicuous above and slightly impressed, giving a subbullate aspect to upper surface, the reticulation prominent and sharp on lower surface, evident but not conspicuous above, the costa elevated beneath, nearly plane on upper surface or shallowly grooved; flowers 5-parted, crowded, clustered at defoliated nodes or in leaf axils, sessile or nearly so, the thick rufous-pubescent pedicels (when present) mostly 1–1.5 mm. long, rarely up to 2.5 mm. long. *Staminate flowers: (Lundell 15868, 16759, Gentle 8679)* appearing to be perfect, but functionally staminate, much larger than pistillate flowers; sepals subequal, imbricate, rufous-pubescent with appressed hairs, sericeous within apically, the outer sepals thick, fleshy, ovate or ovate-oblong, 3–3.5 (–4.8) mm. long, up to 2.5 mm. wide, the inner oblong-elliptic and thinner, less pubescent; corolla glabrous, 4–5 mm. long, 5-lobed almost to middle, the tube cupular-campanulate, 1.2–2 mm. high, the sinuses between lobes rarely pleated or rounded, the corolla lobes depressed-ovate, wider than long, 2–3.2 mm. long, 3–3.8 mm. wide, apex acutish to rounded, sagittate at base with the lobes rounded; stamens included; filaments usually borne at or near top of corolla tube, sometimes developed but attached below, the free filaments subulate, tapering above, 1–1.7 mm. long; anthers oblong or ovate-elliptic, about 1.3 mm. long, apiculate; staminodia petaloid, usually small, thin, ovate, subequalling

filaments, rarely over 1.2 mm. long when regular in flower, margin erose, sometimes lobed, apex acuminate and acicular-apiculate, the slender point erect or rarely introrsely curved like a barbless fish hook *(Lundell 16759)*, the staminodia rarely enlarged and subequalling corolla lobes;

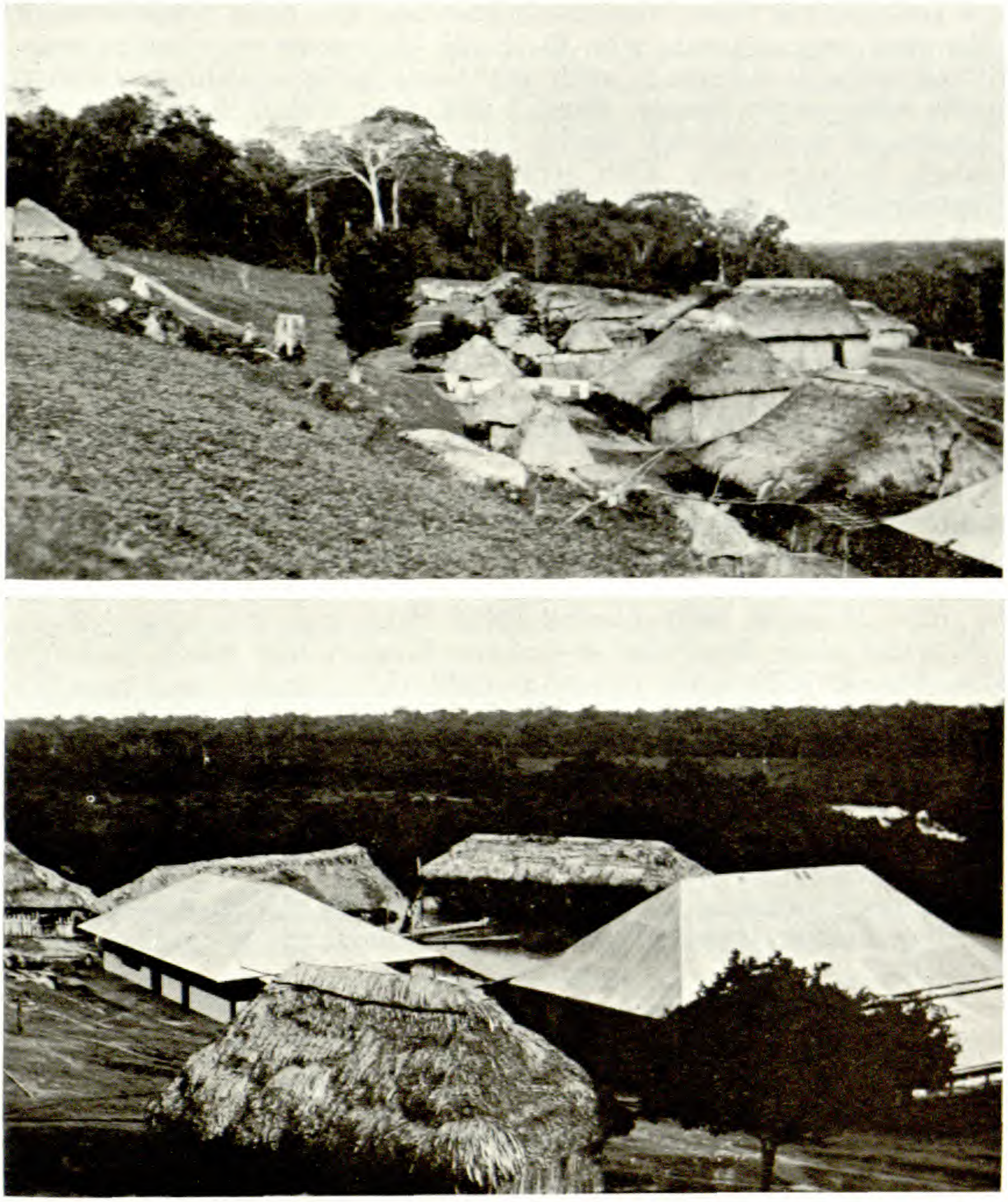

Fig. 3. Views in 1932 of El Paso de Caballo on Rio San Pedro de Martir, the former headquarters of the Chicle Development Company in Peten. This is the type locality of *Bumelia guatemalensis* Standl., *Lucuma amygdalina* Standl. and *Lucuma Durlandii* Standl., described from sterile collections made by W. D. Durland (Paul C. Standley, Trop. Woods 4: 1–11. 1925). Photographs by C. L. Lundell.

ovary pubescent, 2-loculate; style included, glabrous, slender, elongate, with stigma punctiform, the lobes undeveloped. *Pistillate flowers: (Contreras 9472)* sepals imbricate, rufous-pubescent, thick, ovate or broadly ovate, 2–2.4 mm. long, rather sparsely appressed pubescent apically within; corolla glabrous, 3–3.4 mm. long, the lobes exserted, the tube subequalling lobes, cupular-campanulate, the lobes broadly ovate, wider than long, sagittate with the basal lobes rounded; stamens none, without vestiges; staminodia with only basal vestiges in sinuses between corolla lobes; ovary hirsute, about 1 mm. long, ribbed, 2-loculate, with 1 basilateral ovule in each locule; style short, stout, conic, the stigma 2-lobed, well-developed, with conspicuous stigmatic surfaces. *Fruits: (Contreras 6812)* sessile or subsessile, the hairy calyx persistent at base, 1-seeded or 2-seeded, the 1-seeded fruits obovoid, 1.2–2 cm. long, the 2-seeded fruits subglobose and compressed laterally with grove between the seeds on both sides, 1.2–2.5 cm. long, the fruits rather sparsely appressed pubescent to maturity, the pericarp about 2 mm. thick, leathery (when boiled in water); seeds ellipsoid, 1.5 cm. long, compressed laterally on one side in 2-seeded fruits, obscurely maculate, the pale seed-scar covering fully half the seed, shallowly sulcate beyond the hilum; endosperm absent.

Guatemala: Dept. Peten, El Paso, 1925, *W. D. Durland s.n.* (US, ✓type), fruit on short stalks issuing from main twigs, ½–¾ in., ovoid, latex white; Tikal, on trail to Uaxactun Bajo, April 7, 1959, *C. L. Lundell 15868* (LL), tree, 13 in. diam., 30 ft. high, flowers white; Tikal, in *ramonal* on the ruins, March 9, 1960, *Lundell 16759* (LL), tree, 3 in. diam., 20 ft. high, petals white; San Pedro on Cadenas Road, in high forest, bordering river, Jan. 8, 1970, *Elias Contreras 9472* (LL), small tree, "*zapotillo blanco.*" Dept. Izabal, Puerto Mendez, in low forest, bordering Rio Sarstun, 3 km., March 21, 1967, *Contreras 6812* (LL), tree, 45 ft. high, 8 in. diam., fruit dark green, "*zapotillo.*" British Honduras: El Cayo District, in cohune ridge, base of hill, Humming Bird Highway, April 20, 1955, *Percy H. Gentle 8679* (LL), tree, 8 in. diam., flowers white, scented, "*mammy cedrela.*"

My interpretation of *P. Durlandii* is based on the cited collections, including the type. Other collections of this common tree are in the Lundell Herbarium.

The coriaceous subbullate acuminate leaves with undulate margin, rather large and usually widest above the middle, the 9–11 pairs of primary lateral nerves, and the reticulate venation of the lower leaf surface, combined with the persistent closely appressed rufous indument contribute to the distinction of *P. Durlandii* among the Sapotaceae of the Maya region.

In *P. Durlandii* the peculiar flowers are unique in several features. The staminate appear to be perfect, but among the ones dissected no development of the ovules was found. The elongate style, equalling the included corolla lobes, has a punctiform stigma, apparently abortive.

In the staminate flowers, the filaments are attached either near the top of the corolla tube or as much as a third below the top of the tube. Sometimes the filaments are developed below point of attachment all

the way to base of tube, adhering to it, but this development is not uniform, even in a single flower. The staminodia are often variable in size and with irregular marginal and apical protrusions. Mostly the staminodia are 1–1.2 mm. long, thin and ovate, sometimes plicate extrorsely. The versatile anthers are oblong or ovate-elliptic, and apiculate, equalling the filaments.

In *Lundell 18281* the corolla tube of the staminate flowers is distinctly accordion-pleated in the sinuses of the lobes, a very peculiar feature.

As contrasted with the larger staminate flowers, the sepals of the pistillate flowers are rarely more than 2.5 mm. long, and the corolla lobes are exserted. In the smaller pistillate flowers, the style is shorter, thick and conic with a well-developed 2-lobed conspicuous stigma. The stigmatic surface of the lobes is very conspicuous. Although the staminodia are represented by minute vestiges in the sinuses of the corolla lobes in the pistillate flowers, there are no vestiges of the stamens. They are completely suppressed. The ovules, one in each locule, are attached basilaterally. The seed-scar is paler, fully covering half the seed.

The polymorphic unisexual flowers of *P. Durlandii* could be easily misinterpreted as representing more than one species.

Pouteria Gentlei Lundell, sp. nov. – Arbor; ramuli novelli adpresse brunneo-pubescentes; folia petiolata, petiolo 8–13 mm. longo, canaliculato; lamina subcoriacea, oblanceolata vel oblongo-oblanceolata, 10–17 cm. longa, 2.5–5.2 cm. lata, apice subabrupte caudato-acuminata, basi acuminata vel acuta; flores 5-meri, fasciculati; pedicelli crassi, ca. 2 mm. longi, raro ad 2.8 mm. longi; sepala 5, exteriora parva, apice rotundata, ca. 1 mm. longa, interiora late orbiculari-ovata, ad 2.5 mm. longa, parce sericea, ciliata; corolla glabra, ca. 2.5 mm. longa, lobis ovatis; stamina ad 1 mm. longa; filamenta ca. 0.4 mm. longa; antherae ovatae, ca. 0.5 mm. longae; staminodia 5, subulata; ovarium 4-loculare, adpresse hirsutum; ovula 4.

Large tree, the branchlets rather slender, angulate, at first with traces of fine appressed golden-brown hairs, glabrous early; leaves at first with scattered short appressed hairs along the midvein, glabrous early, petiolate, the petioles canaliculate, 8–13 mm. long, slender at first, thickening at maturity; leaf blades subcoriaceous, oblanceolate or oblong-oblanceolate, 10–17 cm. long, 2.5–5.2 cm. wide, apex subabruptly caudate-acuminate, the narrow acumen up to 1 cm. long, obtusish, base acute or acuminate and decurrent on petiole, plainly but not conspicuously reticulate-veined on both surfaces, the midvein prominent, slightly elevated above, the primary lateral veins slender, 7–10 pairs, elevated beneath, rather inconspicuous above; flowers 5-parted, fasciculate in the leaf axils, or racemose on short leafless branchlets, the pedicels stout, mostly about 2 mm. long, sometimes up to 2.8 mm. long, sericeous with fine golden-brown hairs; sepals 5, imbricate, very unequal, the outer one rounded, about 1 mm. long, the broadly ovate inner ones up to 2.5 mm. long, thinly sericeous with golden-brown hairs on both outer and inner surfaces, the outer sepals coriaceous, the innermost thin, all ciliate; corolla 5-lobed, subequalling calyx, about 2.5 mm. long, glabrous, lobed

to the middle, the lobes ovate, entire, veiny, not ciliate; stamens less than 1 mm. long, the filaments borne at top of corolla tube, very slender, about 0.4 mm. long; anthers small, ovate, about 0.5 mm. long; staminodia 5, exceeding stamens but shorter than corolla lobes, subulate, thickish, widened at base, tapering above; ovary hirsute with ascending hairs, 4-loculate; ovules 4, style thickish, glabrous, short.

British Honduras: Toledo District, in high ridge, on hill slope near Pate's Camp, Edwards Road beyond Columbia, Feb. 20, 1951, *Percy H. Gentle 7208* (LL, type), large tree, small white flowers, "*mammy cederia*," "*mammy cerilla.*"

A fruiting collection from the same locality, *Gentle 7158* (LL), appears to be referable to *P. Gentlei.* It has 4 or 5, usually 5 depressed-ovate or ovate-rounded sepals, 1.4–2 mm. long, 1.8–2.8 mm. wide, sericeous within and ciliate. These are from the base of the fruits, and no pubescence persists on the outer surface of the sepals. The ovary is ovoid, pubescent with appressed hairs, and the style is thick, short and conic. The mature 1-seeded fruits are pale yellow-brown when dry with wrinkled surface, subglobose, up to 3 cm. long. They are sessile at defoliated nodes. Traces of appressed pubescence persist even at maturity. The seed-scar is very large, covering half the seed. There is no endosperm.

Pouteria mayana Lundell, sp. nov. — Arbor, ca. 40 m. alta, 65 cm. diam.; ramuli graciles; folia petiolata, petiolo tenuissimo, canaliculato, 1.3–3 cm. longo; lamina membranacea, novella sericea, oblanceolata vel anguste elliptico-oblonga, 6.5–15 cm. longa, 2–5 cm. lata, apice obtusa vel subacuminata, basi cuneata, utrinque reticulata; pedicelli fructiferi subnulli; sepala parva, late ovata, ad 2 mm. longa, 2.7 mm. lata, apice obtuso-rotundata, intus sericea; bacca subglobosa, ad 4 cm. diam., 3.3 cm. longa; semina elliptica, ad 2.5 cm. longa, 1.2 cm. lata, lateraliter compressa.

Tree, about 40 m. tall, 65 cm. diam., the branchlets rather slender, the leaf buds and apices of branchlets pubescent with appressed reddish hairs, the branches glabrate; leaves petiolate, the petioles very slender, canaliculate, 1.3–3 cm. long; leaf blades very thin, membranaceous, apparently sericeous at first on lower surface, glabrous at maturity, oblanceolate or narrowly elliptic-oblong, 6.5–15 cm. long, 2–5 cm. wide, apex obtuse or subacuminate, the acumen obtuse, base cuneate, decurrent on the petiole, costa elevated beneath, shallowly impressed above, with a sharp narrow medial ridge, primary lateral veins 7 or 8 pairs, very slender, arcuately ascending, equally evident on both surfaces, reticulate, the reticulation open; sepals persisting at base of fruits small, depressed-ovate, up to 2 mm. long, 2.7 mm. wide, broadly obtuse-rounded, sericeous on inner surface; fruits subsessile, globose or depressed-globose, up to 4 cm. in diam. at maturity, 3.3 cm. long, the surface brown, minutely granular and rather scurfy, closely resembling the surface of the sapodilla fruits; the pericarp drying hard, 2.5–3 mm. thick; fruit evidently pulpy; seeds several, dark brown, lustrous, flattened with sharp edge, elliptic with the ventral margin only slightly curved, up to 2.5 cm. long, 1.2 cm. wide; seed-scar lateral, linear, extending nearly entire length of the

ventral margin; endosperm present, the cotyledons thin, flat, wide, nearly as long and wide as the seed.

Guatemala: Dept. Peten, El Ceibo, on La Libertad Road, 5 km., in high forest, *ramonal*, March 28, 1965, *Elias Contreras 5372* (LL, type), tree about 120 ft. high, 27 in. diam., fruit chocolate-brown, sweet, "*trompillo-o-camiste de montana.*"

In the absence of flowers, the generic position of the species is uncertain. The small sepals, persisting at base of fruits, and the very thin leaves on slender petioles, well-mark the taxon.

Pouteria petenensis Lundell, Wrightia 5: 6. 1972.

Flowers fasciculate on old wood at defoliated nodes; pedicels slender, 3–4 mm. long, pubescent with short appressed reddish hairs; sepals 5, rarely 4, imbricate, unequal, the outer smaller, ovate or ovate-elliptic, 2.5–3.3 mm. long, apex rounded, finely appressed pubescent, ciliate, the reddish hairs densest at apex, sericeous within; corolla greenish, urceolate, 4 mm. long, 5-lobed, the lobes broadly ovate-rounded, about 1.3 mm. long, overlapping at sinuses, the apex subtruncate, reflexed, ciliate, the corolla otherwise glabrous; stamens 5, included, 3.8–4 mm. long, glabrous; filaments stout, free about 0.7 mm. above base of corolla tube; anthers basifixed, broadly ovate, about 1.2 mm. long, the apex rounded and sharply apiculate; staminodia none; ovary 5-lobed, hirsute with straight whitish hairs, 5-celled, with 1 lateral ovule in each cell; style glabrous, conical, thick, 5-angled, about 2.5 mm. long, the stigma capitate; mature fruits subsessile on thick pedicels, depressed globose, up to 3 cm. long, 4.5 cm. wide, depressed apically, drying pale, gray-brown, scurfy, the pericarp hard, thin, drying about 1.2 mm. thick, pulpy within; seed brown, shining, obovoid-ellipsoid, 2.1–2.3 cm. long, about 1.2 cm. wide, compressed, slightly beaked at end, the lateral seed-scar linear, extending almost entire length of seed; endosperm none.

Guatemala: Dept. Izabal, Cadenas, in high forest, *zapotal*, on Arenales Road, about 5 km. west of the village, Feb. 16, 1975, *C. L. Lundell & Elias Contreras 18982* (LL). tree, 80 ft. high, 30 in. diam., fruits grayish, "*zapotillo,*" "*comida de Mico Leon.*" Dept. Peten, La Cumbre, Las Canas, in *zapotal*, east of km. 142, bordering the Peten-Izabal Road, March 9, 1975, *Lundell & Contreras 19073* (LL), tree, 60 ft. high, 15 in. diam., flowers greenish-yellow, "*zapote comida de Mico Leon;*" La Cumbre, in *zapotal* on hill, west of km. 141/142 of the Peten-Izabal Road, March 13, 1975, *Lundell & Contreras 19095* (LL), tree, 70 ft. high, 15 in diam., flowers greenish-yellow, "*zapote comida de Mico Leon.*"

Described from immature fruiting material, the additional collections of flowers and mature fruits confirm the reference of the species to *Pouteria* in the broad sense that the genus is accepted by Baehni, Cronquist and others. The urceolate corolla with 5 short ciliate lobes, stamens free almost to base, the absense of staminodia, the flattened lustrous brown seed with linear seed-scar almost its entire length, and the absence of endosperm are features to be noted.

Pouteria potosina Lundell, sp. nov. – Arbor parva; ramuli dense et adpresse brunneo-pubescentes; folia novella sericea, petiolata, petiolo

6–15 mm. longo; lamina chartacea vel subcoriacea, obovata vel obovato-elliptica, 7–14.5 (–22) cm. longa, 3.5–5.5 (–7.5) cm. lata, subabrupte acuminata vel obtusa, basi acutiuscula, subtus reticulato-venosa; flores 4- vel 5-meri, unisexuales, fasciculati; pedicelli ad 2.5 mm. longi; adpresse brunneo-pubescentes; sepala libera; corolla glabra, lobis late ovato-rotundata, sagittata; filamenta fauce affixa, subulata; antherae lanceolatae, apiculatae; staminodia ovata, acuminato-apiculata, erosa; ovarium 2- vel 3-loculare, adpresse hirsutum; bacca subglobosa, ca. 2 cm. diam.; semina 1, ellipsoidea, ca. 1.2 cm. longa.

Small tree, up to 12 m. tall, 20 cm. diam.; branchlets rather slender, often short, pubescent at first with reddish-brown appressed hairs; leaves sericeous at first with reddish-brown hairs, the pubescence densest along midvein and petiole, glabrous early, petiolate, the petioles 6–15 mm. long, shallowly grooved, drying blackish; leaf blades firm, chartaceous or subcoriaceous, obovate or obovate-elliptic, 7–14.5 (–22) cm. long, 3.5–5.5 (–7.5) cm. wide, apex subabruptly acuminate or obtuse, the acumen up to 2 cm. long, obtuse or acutish, base acutish, midvein prominent beneath, nearly plane above, the primary lateral veins 7–9 pairs, elevated beneath, slender above, widely ascending, the reticulation conspicuous beneath. *Staminate flowers: (Lundell & Lundell 7199)* 5-parted, axillary, fasciculate, the pedicels and calyx pubescent with reddish-brown appressed hairs; pedicels short, rarely up to 2.5 mm. long; sepals free to base, imbricate, ovate, elliptic or obovate, the inner with hyaline margins, the outer thicker, 2.2–4 mm. long, up to 3 mm. wide, sericeous within, usually rather sparsely, ciliate; corolla glabrous, about 4 mm. long, the tube about 1.5 mm. high, the corolla lobes broadly ovate-rounded with overlapping rounded basal lobes; filaments attached to corolla tube, free at apex of tube, the free filaments subulate, about 1.3 mm. long; anthers lanceolate, apiculate, equalling the filaments; staminodes petaloid, ovate, acuminate-apiculate, with erose margin, shorter than stamens; ovary appressed pubescent, costate, 3-loculate, with 1 basilateral ovule in each locule; style slender, conical, the stigma punctiform (nonfunctional). *Pistillate flowers: (Lundell 12262)* 4- or 5-parted; calyx and pedicels densely pubescent with appressed reddish-brown hairs, the pedicels up to 2.5 mm. long, stout; sepals free to base, ovate-elliptic or obovate, 2.2–3 mm. long, sericeous within; corolla glabrous, about 4 mm. long, exserted, the tube up to 2 mm. long, the corolla lobes 4 or 5, broadly ovate-rounded, about 2.5 mm. long, 3 mm. wide, sagittate at base; stamens 5, usually with one or more abortive anthers; staminodia petaloid, sometimes reduced to vestiges or absent; ovary pubescent with appressed hairs, ovary 2- or 3-loculate, with 1 basilateral ovule in each locule; style columnar, ca. 1.4 mm. long, the stigma with 2- or 3-minute distinctive lobes with white stigmatic surface; fruits subglobose, appressed pubescence persistent, dense at base, about 2 cm. in diameter, 1-seeded, the seed-coat more or less grown to pericarp, the seed-scar basilateral; seed ellipsoid, 1.2 cm. long, rugose.

Mexico: San Luis Potosi, Tamazunchale, in forest on hillside, alt. 300 m., July 1937, *C. L. & Amelia A. Lundell 7199* (LL, staminate flowers), tree, diam. 15 cm., height 12 m., corolla white; Tamazunchale, on moun-

tain side, near Moctezuma River above Tamazunchale, July 15, 1943, *C. L. Lundell 12262* (LL, type, pistillate flowers), tree, 8 in. diam., 25 ft. high, corolla greenish. Other collections of the species from the vicinity of Tamazunchale are: *C. L. Lundell 12254* (LL), *C. L. Gilly, Sr. & H. W. Rickett 13* (LL), *14* (LL), and *J. Rzedowski 11008* (LL).

A species with flowers functionally unisexual, it is related to *P. Durlandii* (Standl.) Baehni. From the latter, *P. potosina* differs in its mostly smaller mostly obovate leaves; staminate flowers 5-parted with inner sepals with hyaline margins; pistillate flowers 4- or 5-parted with some anthers abortive, and staminodia sometimes abortive or absent, or with only one or two developed in a flower, with ovary 2- or 3-loculate, and columnar style with minute but distinct stigma lobes. In *P. Durlandii* the flowers of both sexes are regularly 5-parted and the ovary is 2-loculate, the style in pistillate flowers is short and conical, with stamens absent in the pistillate flowers, and with the staminodia reduced to basal vestiges. These are basic floral differences.

SCROPHULARIACEAE

Schlegelia macrocarpa Lundell, sp. nov. – Arbor, ad 16 m. alta, 38 cm. diam., ramulis crassis; folia opposita, subequalia, coriacea, petiolata, petiolo crasso, 8–22 mm. longo; lamina late obovata vel raro elliptica, 8.5–15 cm. longa, 5–9.5 cm. lata, apice rotundata, basi acuta; inflorescentia axillaris, hispidula, paniculata, ad 3.5 cm. longa; pedicelli fructiferi crassi; calyx ad 2 cm. diam.; fructus globosus, ad 5 cm. diam.; semina parva, 4–5 mm. longa, minute foveolata.

Tree, up to 16 m. tall, 38 cm. diam., the branchlets thick, hispidulous at first; leaf buds densely hispidulous, the short rigid hairs thicker below; leaves opposite, pairs equal or nearly so, coriaceous, glabrous at maturity, petiolate, the petioles rigid, thick, rugulose, canaliculate, 8–22 mm. long; leaf blades broadly obovate or rarely elliptic, 8.5–15 cm. long, 5–9.5 cm. wide, apex broadly rounded, base acute and decurrent on petiole, the midrib thick and elevated beneath, nearly plane above, the primary lateral veins 6 or 7 pairs, rather slender but prominent beneath, rather obscure above, the blade with a field of small glands at base on each side of midvein; inflorescence axillary, at defoliated nodes in fruit, hispidulous with short stiff hairs, appearing paniculate in fruit, up to 3.5 cm. long including stalks of fruits, the branches and stalks thick; calyx subtending fruits coriaceous, irregularly split, up to 2 cm. in diam., with traces of hispidulous pubescence; fruits subglobose, large, up to 5 cm. in diam., the surface brown and obscurely rugulose; seeds numerous, small, narrowly ellipsoid, asymmetrical, widest at middle and tapering to both ends, 4.5–5 mm. long, minutely and densely foveolate.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest, Tierra Caliente, 15 km. on rocky hill, Aug. 8, 1971, *Elias Contreras 10970* (LL, type), tree, 50 ft. tall, 20 in. diam., fruit greenish-white.

The size of the tree and the large fruits, up to 5 cm. in diameter, are remarkable in this genus.

Only two other species of *Schlegelia* are known from Guatemala, the common *S. parviflora* (Oerst.) Monachino which has small globose fruits

1 cm. or less in diameter, and the recently described cloud forest species, *S. silvicola* L. Wms. The latter is reported to be an epiphytic shrub or possibly a liana. Its fruits are unknown. *S. silvicola* has glabrous stems, while in *S. macrocarpa* the stems are hispidulous.

All the Middle American species appear to have very similar leaves, usually firmly coriaceous at maturity.

In the absence of flowers, the affinity of *S. macrocarpa* is not apparent. Even the generic position of the taxon is uncertain.

Formerly, the genus *Schlegelia* was placed in the Bignoniaceae (Russell J. Seibert, *The Bignoniaceae of the Maya Area*, Carnegie Inst. Publ. 522: 386. 1940).

VOLUME 5 JULY, 1975 NUMBER 5

WRIGHTIA

A BOTANICAL JOURNAL

CONTENTS

PUBLISHED BY
THE UNIVERSITY OF TEXAS AT DALLAS
RICHARDSON, TEXAS

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. The contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume will contain a series of numbers. These numbers will be issued at irregular intervals over a period of several years.

VOLUME 5, NUMBER 5
ISSUED JULY 1, 1975

Printed in the U.S.A.
Etheridge Printing Company
Dallas, Texas

WRIGHTIA

VOLUME 5 JULY, 1975 NUMBER 5

A STRIKING NEW SPECIES OF OTTOSCHULZIA (ICACINACEAE) FROM THE LOWLANDS OF GUATEMALA

CYRUS LONGWORTH LUNDELL
DIRECTOR, PLANT SCIENCES LABORATORY
THE UNIVERSITY OF TEXAS AT DALLAS

Ottoschulzia, a poorly known genus of two or three species in the West Indies, occurs on the Isle of Pines in Cuba, but it has not been reported from the mainland. Its discovery in Guatemala is a remarkable addition to the flora of the Yucatan Peninsula.

I am indebted to the New York Botanical Garden for the loan of its material of the genus, including isotypes and type fragments of all the West Indian species.

Ottoschulzia pallida Lundell, sp. nov. – Arbor, ad 15 m. alta, 20 cm. diam.; ramuli graciles, pube brevi; folia alterna, subcoriacea, pallida, petiolata, petiolo 5–10 mm. longo; lamina ovata vel elliptica, 6–11 cm. longa, 3–5 cm. lata, apice subabrupte acuminata, basi rotundata et acutiuscula vel acuta; flores unisexuales, cymosi, 5-meri. *Flores masculi:* calyx campanulatus, carnosus, ca. 2 mm. longus; sepala parva, imbricata, ovato-deltoidea, 1 mm. longa, acuta; corolla gamopetala, 5-lobata, lobis valvatis, crassis, lanceolatis, acutis, intus carinatis, reflexis; stamina apice tubi corollae affixa; filamenta crassa; antherae sagittatae, apice attenuatae, apiculatae. *Flores feminei:* corolla parva; stamina abortiva, ligulata; ovarium glabrum, liberum, sessile, 1-loculare; stylus brevis; ovula 2. *Drupa* ellipsoidea vel obovoidea, ad 2.5 cm. longa, putamine intus pilosulo; semem solitarium, loculo conforme.

Tree, up to 15 m. tall, 20 cm. diam., the branchlets slender, at first minutely pubescent with reddish simple and malpighiaceous hairs, glabrous in fruit; leaves alternate, the young pubescent at first with minute reddish malpighiaceous hairs, especially along the petiole and midvein of blade on both surfaces, essentially glabrous at maturity, petiolate, the petioles stout, minutely rugulose, canaliculate, 5–10 mm. long; leaf blades subcoriaceous, pallid, ovate or elliptic, 6–11 cm. long, 3–5 cm. wide, apex subabruptly acuminate, the acumen acutish to obtuse, short or long, base rounded and acutish, or acute, the midvein almost plane above, rather slender and elevated beneath, the primary lateral veins 8 or 9 pairs, slender, arcuately ascending, the veins finely but openly reticulate, rather obscure above, not impressed as in *O. cubensis*; flowers unisexual, cymose, 5-parted, corolla gamopetalous (the staminate appearing perfect). *Staminate flowers: (Contreras 8461)* cymes axillary, supraaxillary, or borne at bracteate nodes on young shoots with terminal leaves, the cymes then

appearing paniculate *(Contreras 8419)*; flowers sometimes solitary, mostly in 3- or 5-flowered cymes, or the cymes sometimes multiflowered and crowded, finely pubescent with reddish-brown hairs, the peduncles equalling petioles, mostly shorter, bearing small lanceolate-ovate bractlet at apex below each flower; pedicels in cymes short, thick, sometimes up to 2 mm. long, articulate at base; calyx campanulate, fleshy, about 2 mm. long, minutely pubescent with reddish malpighiaceous hairs, the inner surface glabrous, the 5 sepals imbricate, ovate-deltoid, about 1 mm. long, acutish, ciliolate; corolla gamopetalous, the 5 lobes fleshy, valvate, united at base into short tube 0.5–0.7 mm. high, the tube glabrous, the lobes lanceolate, 2.5–3 mm. long, reflexed, acutish, pubescent with minute reddish appressed malpighiaceous hairs on outer surface, prominently and narrowly keeled on inner surface, furrowed along sides of keel, with pockets at base on each side of keel, the inner margins and keel minutely papillate, otherwise glabrous; stamens alternate with petals, borne at apex of corolla tube; filaments thick, about 0.5 mm. long; anthers basifixed, sagittate, lanceolate, 2 mm. long, tapering from base to the acute-acuminate apiculate apex, the anthers arching inward and overlapping at apex, papillate apically and with a few minute malpighiaceous hairs dorsally, dehiscent along the lateral edges; disk none; ovary free, small (abortive), ovoid, glabrous and smooth, thick and conical above, about 1.5 mm. long, the stigma obscurely bifid, 1-loculate, the walls thick, ovules 2 (abortive), pendulous, the funicle of one slightly longer. *Pistillate flowers: (Contreras 8459, 8467)* cymes axillary or supraaxillary, usually reduced to a single flower, the peduncle short, often only 2–3 mm. long, minutely pubescent, sometimes equalling petiole, with small apical bractlets; calyx as in staminate flowers; corolla gamopetalous, reduced, about 2.5 mm. long, including the short tube; stamens abortive, borne at apex of tube, ligulate, apiculate, the filaments indistinct from abortive anthers; disk absent; ovary free, glabrous, tapering into the thick conical style, 1-loculate, with 2 pendulous superposed ovules; stigma minutely bifid. *Fruits: (Contreras 9982)* solitary in leaf axils or at defoliated nodes, the peduncles usually short, thick; calyx persistent at base, not accrescent; drupes ellipsoid or obovoid, up to 2.5 cm. long, smooth, apiculate, the locule pubescent inside, the pericarp thin; 1-seeded, the seed up to 2 cm. long; embryo about 1.5 cm. long, the cotyledons thin, the radicle elongate, terete, the endosperm copious.

Guatemala: Dept. Peten, Dos Lagunas, El Cedro, in high forest, *zapotal*, bordering corn field, west, May 4, 1969, *Elias Contreras 8461* (LL, type, staminate flowers), tree, 35 ft. high, 3 in. diam.; Dos Lagunas, El Bergelito, in *ramonal*, on Ixcanrio road, April 27, 1969, *Contreras 8419*, staminate flowers (LL), tree, 45 ft. high, 6 in. diam., flowers greenish-yellow; Dos Lagunas, El Cedro, in high forest, *zapotal*, km. 8 of Ixcanrio road, May 1, 1969, *Cantreras 8431*, pistillate flower and immature fruits (LL), tree, 40 ft. high, 4 in. diam., fruit green; Dos Lagunas, El Cedro, in high forest, *zapotal*, bordering corn field, west, May 3, 1969, *Contreras 8459*, pistillate flower and immature fruits (LL), tree, 45 ft. high, 6 in. diam., fruit green; Dos Lagunas, El Cedro, in high forest,

zapotal, bordering corn field, west, May 4, 1969, *Contreras 8467*, pistillate flowers and immature fruits (LL), tree, 25 ft. high, 3 in. diam., fruit green; Dos Lagunas, El Cedro, in high forest, *zapotal*, bordering corn field, west, May 5, 1969, *Contreras 8470*, staminate flowers (LL), tree, 40 ft. high, 5 in. diam., flowers greenish-yellow. Dept. Izabal, Puerto Mendez, on top of rocky hill in low forest, bordering village, west, June 8, 1970, *Contreras 9982*, well developed fruits (LL), tree, 45 ft. high, 8 in. diam.

The type species, to which I consider *O. pallida* as having affinity, is *Ottoschulzia cubensis* (Wright) Urban (Symb. Antill. 7: 273. 1912), based on *Poraqueiba cubensis* Wright ex Griseb. Cat. 119. 1866. Described by Urban as gamopetalous, Howard redescribed and illustrated *O. cubensis* as having free petals (Contr. Gray Herb. 142: 30–34. 1942) in his useful treatise on the New World genera. In *C. Wright s.n.* from Cuba, a flowering and fruiting specimen at the New York Botanical Garden from the College of Pharmacy Herbarium deposited in 1948, the corolla is gamopetalous as described by Urban. Also, *E. L. Ekman 7425* (NY) from Oriente, Cuba has flowers with the corolla gamopetalous. This material was not available to Howard in 1942.

O. domingensis Urban, as represented by *E. L. Ekman 4565* (LL) from Haiti, has a gamopetalous corolla like *O. pallida*. The paucity of collections of flowering material from the West Indies accounts for the discrepancies in the interpretation of floral characteristics. It is probable that all species in the genus have unisexual flowers.

I interpret the inflorescence of *O. pallida* to be cymose, although often reduced to a single axillary short stalked flower. In *Wright 2639* (NY), the type collection of *O. cubensis*, the inflorescence appears to be racemose, as interpreted by Howard (op. cit.).

Occasionally the ovary in pistillate flowers in short hirsute, with glabrous ovaries in other flowers of the same inflorescence. This may be because of a diseased condition, for the ovary is glabrous normally in both staminate and pistillate flowers.

TAXONOMY OF HAPLOESTHES (ASTERACEAE-SENECIONEAE)

B. L. TURNER[1]

Abstract

Turner, B. L. (Department of Botany, The University of Texas, Austin 78712). *Haploesthes* is comprized of three gypsophilic species centered in north-central Mexico and the adjacent United States. *H. Greggii*, with three varieties, is widespread and variable. *H. robusta* and the newly described *H. fruticosa* are known from only their type localities and immediate vicinities. Chromosome numbers ($n = 18$ pairs) are reported for seven populations, including *H. robusta* and the several varieties of *H. Greggii*.

Haploesthes is a genus of three species largely confined to gypsiferous ($CaSO_4$) soils of southern New Mexico, western and southern-most Texas and north-central Mexico. The generic name is from the Greek meaning "simple garment" in reference to the relatively few involucral bracts found in the species concerned. It was first proposed by Gray in 1849 to accomodate his newly described *H. Greggii*. I. M. Johnston (1941) described two new varieties for this species; he also added a second well-marked species, *H. robusta*.

The present treatment recognizes the same taxa accepted by Johnston, plus a newly described third species, *H. fruticosa*, a shrubby gypsophile from relatively high elevation (8,000–9,000 ft.) on Sierra de la Paila, Coahuila, Mexico. Johnston (1941) saw only fragmentary material of only one collection of this taxon (*Purpus 4708;* GH, US), relegating this to *H. Greggii* var. *Greggii*, which it superficially resembles. However, recent collections and field observations by Dr. M. C. Johnston and colleagues reveal this taxon to be quite distinct, both as to habitat, habit, and involucral features. Finally, it should be noted that Dr. John Strother, who is treating the genus for the North American Flora (New York Botanical Garden) also recognizes the three specific taxa treated here, but treats the var. *Greggii* to include the var. *multiflora*. Such a treatment is largely a matter of taste since most any regional populational element might be lumped or split, depending on judgements as to what constitutes sufficient character-assemblages for recognition. My "taste" has been largely affected by field experience with the taxa concerned: they simply look different when seen growing in their natural habitats; when dressed down dead it is difficult to find discriminatory features, but I believe those characters used in the key will do the job.

The generic relationships of *Haploesthes* seem clear. It is closely related to *Sartwellia* and *Flaveria*, as indicated by Turner and Johnston (1961) and Turner (1972), who suggest that these three genera be treated as sole members of the subtribe Flaverinae. The position of the subtribe itself is problematical, because of the seemingly proper placement of *Haploesthes* in the tribe Senecioneae by Bentham (1873), Gray (1886) and Rydberg (1927), whilst these several same authors place *Sartwellia* and *Flaveria* in the tribe Helenieae. Turner and Powell (1975), following suggestions of yet earlier workers, including Bentham himself (Powell and Turner, 1974), have dismantled the polyphyletic tribe Helenieae, relegated the subtribe

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Flaverinae (including *Haploesthes*) to the tribe Senecioneae where it presumably belongs, in spite of the several reservations expressed by other workers (Ornduff *et al.*, 1963).

Chromosome Numbers

Chromosome numbers are known for all of the taxa except the newly described *Haploesthes fruticosa*. These were obtained from meiotic material collected in the field and counted using standard acetocarmine staining procedures. The chromosomes are of medium size and show consistently 18 bivalents at metaphase I of meiosis; at late prophase two chiasmata are readily seen and in only one preparation *(Powell & Turner 2331)* were fragments or B chromosomes noted. Altogether, counts for ten populations have been reported (Tab. 1) and it appears that the base number for the genus is $x = 18$, much as found for the closely related genera *Sartwellia* and *Flaveria* (Turner, 1971).

Table 1. Chromosome counts for taxa of *Haploesthes*.

Taxon	Voucher Collection	*n* number
H. Greggii var. *Greggii*	MEX. Nuevo Leon: *Powell & Turner 2322; 2331.*	18 II
H. Greggii var. *Greggii*	MEX. Coahuila: *Powell & Turner 2252.*	18 II
H. Greggii var. *multiflora*	MEX. Nuevo Leon: *Powell & Turner 2331.*	18 II*
[a]*H. Greggii* var. *texana*	U.S.A. Texas: Brewster Co., *Powell et al. 1542.* (SRSC); *Watson 24.* (SRSC).	18 II
[b]*H. Greggii* var. *texana*	U.S.A. Texas: Ector Co., *Raven & Gregory 19225.*	18 II
[a]*H. Greggii* var. *texana*	U.S.A. Texas: Terrell Co., *Ellison & Turner* 43.	18 II
H. robusta	MEX. Coahuila: *Bacon et al. 1090; Strother 1129.*	18 II

Acknowledgements

I am grateful to the following institutions for the loan of herbarium material: GH, LL, MICH, MO, SMU, TEX, US. A complete card file (xeroxed) of specimens upon which the dot map is based is on file at TEX and data from this will be supplied upon request. Thanks are also expressed to Dr. M. C. Johnston for the Latin diagnosis of *Haploesthes fruticosa*, to Dr. John Strother for his appraisal of the present manuscript and to Dr. A. M. Powell for his stimulating discussions in reference to postulated relationships of *Haploesthes* with both *Sartwellia* and *Flaveria*, the latter of which he currently has under monographic study. Field work for the preseent study has been supported in part by NSF grant 29576X.

[a]Powell and Sikes (1970)
[b]Ornduff *et al.* (1963)
*Plus 3-4 fragments

HAPLOESTHES A. Gray

Perennial succulent herbs or small shrubs, 0.3–1.5 m. tall, the stems and foliage glabrous, arising from a stout, woody, tap root; leaves opposite, linear; inflorescence a somewhat lax, naked corymb; receptacle convex, naked; involucre turbinate to hemispheric, the bracts 5–6, in 1 or 2 series; ray florets 5 or 8, yellow, pistillate and fertile, the ligules small, 1–3 lobed, about as long as the tube; disc florets numerous, fertile, the corollas yellow, cylindric, with a poorly developed throat and 5 recurved lobes; achenes mostly cylindric, black at maturity, with ca. 9 ribs; pappus uniseriate, of 25–40 setose bristles, 1–3 mm. long; style branches short, truncate.

Base chromosome number, $x = 18$.

Type species, *H. Greggii* A. Gray. 02710291

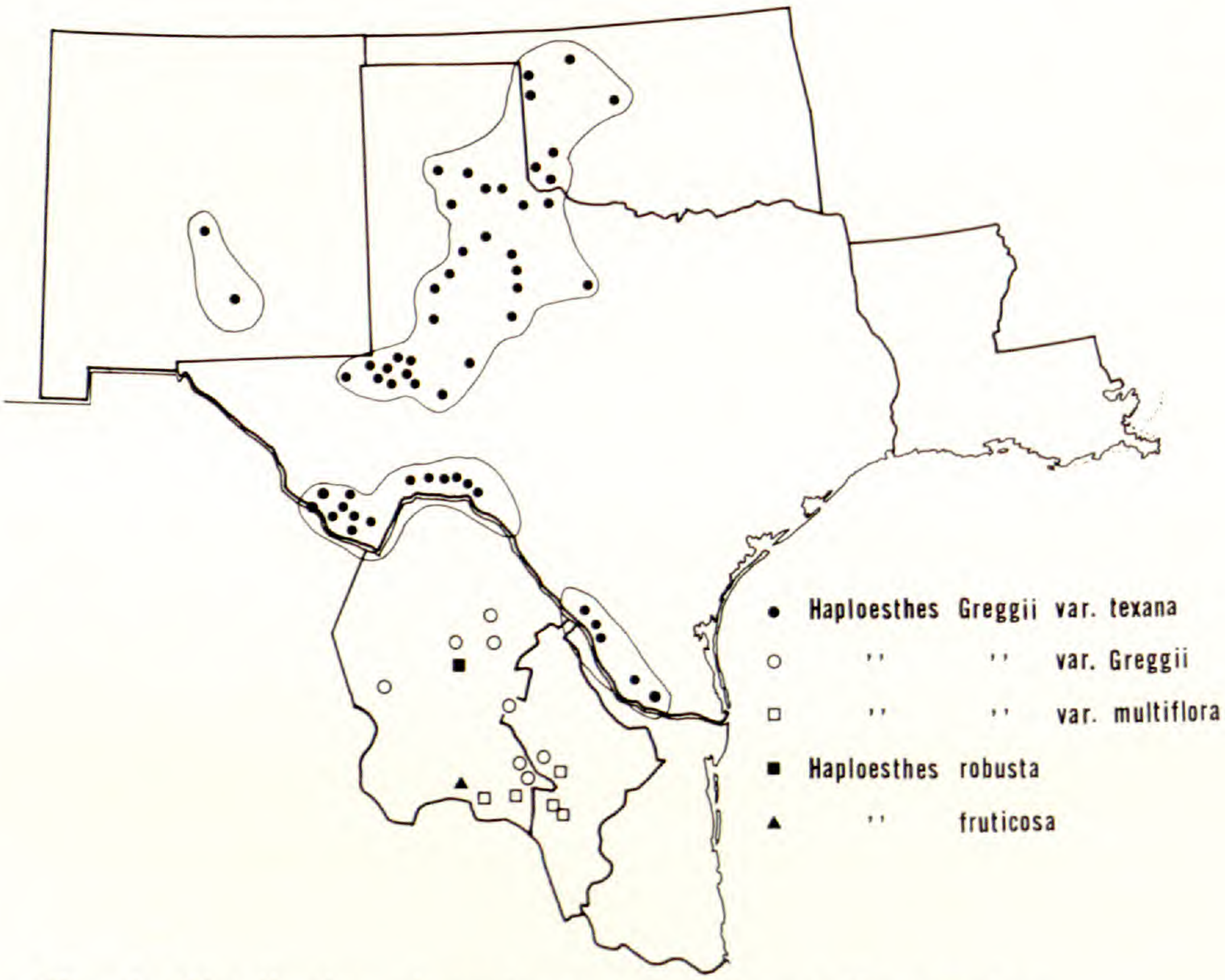

Fig. 4. Distribution of species and varieties of *Haploesthes*.

Key to Species

1. Plants very succulent, the branches heavy, sprawling along the ground; involucral bracts fleshy, when fresh, not at all thin and membranous; achenes rather uniformly pubescent with numerous hairs; known only from along wet sites near Cuatro Cienegas (Fig. 4) ..... 1. H. *robusta*

1. Plants not noticeably succulent, the stems brittle and usually stiffly erect (often sprawling in *H. Greggii* var. *multiflora*); involucral bracts, when fresh, thin and membranous in the upper half; achenes glabrous to sparsely pubescent, not uniformly pubescent throughout (2).
2. Plants perennial herbs from woody tap roots, 0.6 m. tall or less; stems herbaceous below; involucral bracts not succulent and distinctly carinate below ..... 2. *H. Greggii*
2. Plants distinctly shrubby, 0.6–1.5 m. tall; stems woody below; involucral bracts succulent below and distinctly carinate or keeled ..... 3. *H. fruticosa*

1. Haploesthes robusta I. M. Johnst., Journ. Arn. Arb. 22: 121. 1941. Mexico: Coahuila, 3 mi. south of Cuatro Cienegas, Jul. 18-20, 1939, *S. S. White 1923* (holotype, GH; isotype, MICH) "succulent plant on salt land."

Succulent perennial, the stems sprawling; leaves short, succulent, 3-sided before drying, 1–3 cm. long; involucre broadly turbinate, succulent, before drying, 6–7 mm. long, the bracts drying yellow; florets ca. 40 per head; rays ca. 3 mm. wide, 3.5 mm. long; disc corollas ca. 5 mm. long; achenes 2–3 mm. long, rather evenly and densely pubescent throughout.

Chromosome number, $n = 18$ pairs.

Distribution: Known only from the gypseous flats, 3–8 mi. south of Cuatro Cienegas where it occurs in relatively bare moist areas along perennial streams. Flowering, Mar.-Sep.

A very distinct species when viewed in the field, but upon drying, the succulent features are not so noticeable and one must rely upon the larger heads and more pubescent achenes to distinguish it from its apparently most closely related taxon, *H. Greggii* var. *Greggii*. This relationship was also recognized by Johnston (1941b); however, he was not familiar with *H. robusta* in its living state and consequently was presumably unaware of its remarkably succulent habit. He was correct in his surmise that the species was possibly a gypsophile, in spite of label data indicating a "salt-land" habitat.

Haploesthes robusta is relatively rare, even at the single locality from which it is known, occurring sporadically in bare, sandy (gypsum), open areas at the fringe of *Spartina*-dominated grassy flats along perennial streams. The valley in which Cuatro Cienegas sits is extraordinary for the number of local endemics which it contains, some of the more notable being *Dyssodia gyposphila* Turner, *Gaillardia gypsophila* Turner and *Machaeranthera restiformis* Turner (Turner, 1973a,b).

2. Haploesthes Greggii A. Gray

Key to Varieties

1. Heads longer than broad; involucral bracts 4–6 mm. long, mostly turning conspicuously greenish-black (dusky) upon drying; involucres mostly turbinate, 4–5 mm. wide; plants north of (or just along) the Mex.-Tex. border ..... 2b. var. *texana*

1. Heads broader than long; involucral bracts 3–4 mm. long, not turning noticeably dusky upon drying (except occasionally in var. *multiflora*); involucre mostly broadly turbinate to hemispheric, 5–6 mm. wide; plants of north-central Mexico (2).
2. Stems ascending to stiffly erect; involucre broadly turbinate to hemispheric; florets 60–80 per head; plants of relatively low, desert (gypsum) habitats (1600 m. or less) ..... 2a. var *Greggii*
2. Stems sprawling to ascending; involucre broadly hemispheric; florets 100 or more per head; plants of mountainous (gypsum) areas usually in pine woodlands at 1600 m. or more ..... 2c. var. *multiflora*

2a. Haploesthes Greggii A. Gray var. **Greggii,** Mem. Am. Acad. N. S. 4:109. 1849. Mexico: Coahuila, valley near Cienega Grande, 18 May 1847, *Dr. Gregg 68* (holotype, GH; isotype, MO).

Erect perennial, 0.3–0.6 m. tall, the stems herbaceous, brittle, ascending to stiffly erect, arising from a woody tap root; involucre mostly broadly turbinate, 3.5–4.5 mm. long, the bracts *not* (or only faintly) turning dusky upon drying; florets 60–80(90) per head; rays 2 mm. wide, 2.5 mm. long; disc corollas ca. 3 mm. long; achenes ca. 2.5 mm. long, glabrous to sparingly and unevenly pubescent.

Chromosome number, $n = 18$ pairs.

Distribution: North-central Mexico in gypseous soils, mostly in rather bare open areas of intermontane desert habitats from 3000 to 5000 ft. Flowering, Apr.-Nov., depending on rains.

The taxon stands, both morphological and geographically, between the varieties *texana* and *multiflora*. It presumably arose out of the latter giving rise to both var. *texana* and the highly restricted endemic, *H. robusta*.

2b. Haploesthes Greggii var. **texana** (Coult.) I. M. Johnst., Jour. Arn. Arb. 22: 169. 1941. *Aplopappus texanus* Coult., Contr. U. S. Nat. Herb. 1: 40. 1890. Texas: Brewster Co., Chisos Mountains, 1889, *G. C. Nealley 203* (holotype, US).

Erect perennial, 30–100 cm. tall, the stems herbaceous, brittle, ascending to stiffly erect; involucre narrowly to broadly turbinate, 4–5 mm. long, the bracts turning dusky upon drying (rarely not so); florets mostly 20–40(60) per head; rays 2.0–2.5 mm. wide, 3–4 mm. long; disc corollas, 3.0–3.5 mm. long; achenes ca. 2.7 mm. long, glabrous to sparingly and unevenly pubescent.

Chromosome number, $n = 18$ pairs.

Distribution: Gypseous and mixed gypseous soils from the Rio Grande northward to the Oklahoma-Kansas border mostly along the eastern breaks of the Llano Estacado and as isolated populations on local gypsum outcrops in New Mexico, trans-Pecos and southern Texas. Flowering, Apr.-Oct., depending on rains.

This is the most abundant , widespread, variable variety of the species.

It is only weakly differentiated from the var. *Greggii* but can be readily recognized by its involucral bracts which turn dusky upon drying. Populations from northern Texas and Oklahoma have smaller heads with fewer fruits (20–40) than those from trans-Pecos and south-central Texas, suggesting an origin from populations to the South.

Specimens from the type locality are somewhat more robust with broader leaves and larger heads. These characters, however, are quite variable throughout the range; robustness is often a reflection of better growing sites and the primary leaves are typically much larger than those from secondary or cut-back stems. While the dusky heads are characteristic of the taxon, as found on herbarium sheets, occasional heads are nearly as light as var. *Greggii*, this presumably resulting from the rapid manner in which the plants are dried, since heads on the same plant may be variously colored (e.g., *Cory 40620*, GH).

The apparently disjunct populations in southern Texas along the Rio Grande River occur on the Quaternary clays in this region, which are known to contain local mixed gypsum deposits of varying sizes, but never in large, relatively pure, outcrops. Individuals examined from this area are somewhat smaller (30 cm. or less) with a tendency to branch from the base, and they possess more numerous heads, each bearing more numerous florets than characteristic of the taxon elsewhere. Such populations have apparently become established relatively recently, presumably through dispersal along the Rio Grande from populations established along its upper tributaries.

It is surprising that *H. Greggii* is not common on the extensive gypsum outcrops in northcentral trans-Pecos Texas and southcentral New Mexico. Perhaps, it is ill-adapted to the lower rainfall in that region. Instead, the presumably related, obligate gypsophile, *Sartwellia flaveriae*, occupies this region, occurring in similar-type habitats and having a similar habit and flowering period (Turner, 1970).

2c. Haploesthes Greggii var. **multiflora** I. M. Johnst., Jour. Arn. Arb. 22: 170. 1941. Mexico. Coahuila, mountains east of Saltillo, Jun., 1898, *E. J. Palmer 206* (holotype, GH; isotypes, MBG, US).

Perennial herb or subshrub, 30–45 cm. tall with decumbent or sprawling, brittle, stems arising from a tough, woody crown or tap root; involucre hemispheric, 3.5–4.5 mm. long, the bracts 5–8 in number, turning moderately to conspicuously (rarely) dusky upon drying; florets 90 or more per head; rays 2.5–3.0 mm. wide, 3.0–4.5(5) mm. long; achenes ca. 2.5 mm. long, glabrous or nearly so.

Chromosome number, $n = 18$ pairs.

Distribution: Gypsum outcrops in open woodlands, upper elevations (5,000–7,000 feet) of the mountains just southwest of Monterrey, Mexico. Flowering, Jul.–Dec.

This taxon is easily recognized in the field and, because of its montane habitat and sprawling habit, it might justifiably be treated as a distinct species; however, in the dried state, it is morphologically quite similar to

the var. *Greggii*, differing mainly in possessing broader heads with more numerous florets. The involucral bracts, upon drying, usually turn moderately to conspicuously dusky (e.g., *Correll & Johnston 19873*, TEX; *Warnock & Barkley 14742*, GH) but never so pronounced as that found in var. *texana*.

Johnston (1941b) was correct in his assumption that the taxon is a gypsophile. The area about Saltillo has extensive outcrops of gypsum, and I have collected it several times in seemingly pure gypsum in the pine forests near Galeana, about 50 mi. southeast of Saltillo.

3. Haploesthes fruticosa B. L. Turner, sp. nov. — Frutices parvi 0.6–1.5 m. alti caulibus infra medium valde lignosis; folia anguste linearia 3–5 cm. longa, 1–2 mm. lata; involucrum turbinatum 3.5–4.5 mm. longum, phyllaria ovata succulenta infra medium carinata in sicco flavovirentia; flores 25–30; ligulae ca. 3 mm. longae, 2 mm. latae; corollae disci ca. 4.5 mm. longae; achenia 2.0–2.5 mm. longa angulis sparse pubescentibus cetera sparsissime pubescentia; pappus squammelis ca. 34, 2.5–3.0 mm. longis.

Small shrubs, 0.6–1.5 m. tall, the stems distinctly woody below; leaves narrowly linear, 3–5 cm. long, 1.0–2.0 mm. wide; involucre turbinate, 3.5–4.5 mm. long, the bracts ovate, succulent and carinate below, drying greenish-yellow; florets 25–30 per head; rays ca. 2 mm. wide, 3 mm. long; disc corollas ca. 4.5 mm. long; achenes 2.0–2.5 mm. long, sparsely pubescent, especially along the angles, the pappus of ca. 34 bristles, 2.5–3.0 mm. long. Chromosome number, not determined.

Mexico: Coahuila, District of G. Cepeda, Sierra Paila (Valle Seco) at 1650 m. "Bare limestone slope, 1 m. high . . . Frequent colonies, often dense." Jul. 5, 1944, *G. B. Hinton, et al. 16555.* (holotype, US; isotype GH.) Additional specimens examined: Sierra Paila, *Purpus 4708* (GH, US); Sierra Paila, *M. C. Johnston et al. 10,110* (TEX); *10,125* (TEX).

While label data on the type specimen gives the substrate as "limestone," more recent collections by M. C. Johnston *(pers. comm.)* near the type locality indicate that the species is primarily restricted to gypsum. I. M. Johnston (1941) in his treatment of the genus, saw only two sheets of this taxon *(Purpus 4708*, GH, US) accepting these as typical (by penciled notation on the sheet at GH) of *H. Greggii* var. *Greggii;* its relationship is undoubtedly with this taxon, but it is amply distinct both in it habit and involucral morphology, as noted in the key to species.

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TWO NEW GYPSOPHILIC SPECIES OF ERIGERON (ASTERACEAE) FROM NORTHERN MEXICO[1]

B. L. Turner[2]

Exploration of gypsum outcrops in northcentral Mexico has continued to yield a number of previously undescribed species (Turner, 1973; etc.). The two taxa described here are relatively common at the sites indicated, but their absence in seemingly suitable habitats in adjoining regions free of gypsum suggests that they are largely, if not entirely, confined to gypsum substrates.

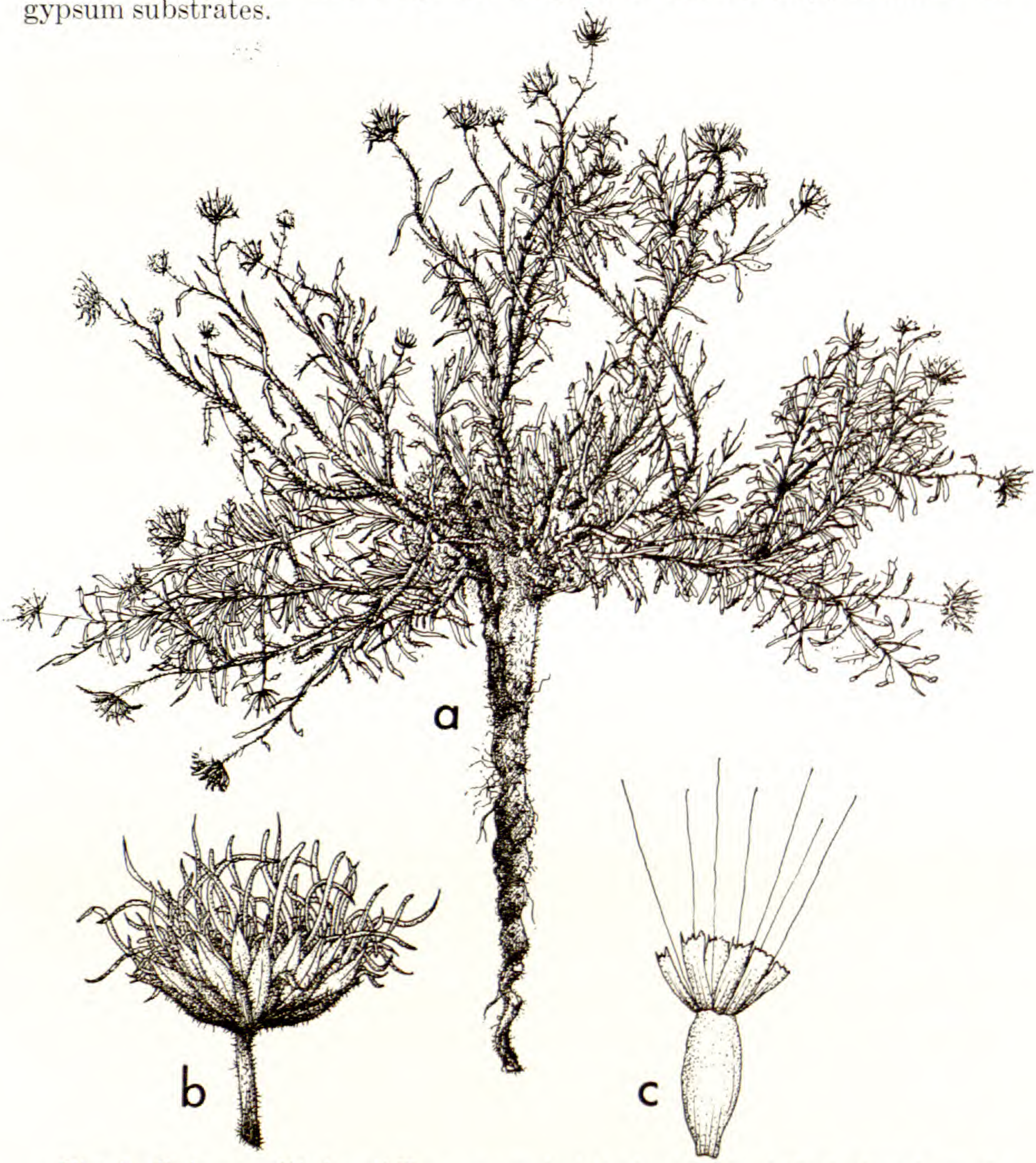

Fig. 5. *Erigeron Pinkavii* Turner: a. habit sketch, × 4/5; b. head, × 6; c. achene, × 15.

[1]Supported in part by N.S.F. Grant 29576X; I am grateful to Dr. M. C. Johnston for the Latin descriptions.

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Fig. 6. *Erigeron gypsophila* Turner: a. habit sketch, × 4/5; b. mid-stem leaves, × 3.

Erigeron Pinkavii Turner, sp. nov. – Herbae perennes 5–20 cm. altae e basi pluriramosae, ramis secundariis procumbentibus; folia caulesque dense pubescentes pilis albis crispatis effusis; folia inferiora lineario-oblanceolata 3–5(–7)-lobata, superiora lineario-ovata amplectentia; capitula multa, pudunculis 3–20 mm. longis; involucra hemispherica 2–3-seriata 3–4 mm. alta 6–8 mm. diametro; phyllaria lineario-lanceolata duplo pubescentia pilis pro parte validis albis effusis pro parte perparvis glandularibus; receptaculum convexum; flores radiati 70–90 ligulis albis vel rosulatis linearibus ca. 0.3 mm. latis 4–5 mm. longis; flores disci 100–150 corollis flavis ca. 2 mm. longis 5-dentatis; pappus duplicatus, setis 6–20 fragilibus ca. 3 mm. longis, squamellis 6–10, 0.2–0.8 mm. longis; achenia ovalia ca. 1.2 mm. longa compressa sparse pubescentia enervata; chromosomatum numerus $n = 9$.

Perennial herbs 5–20 cm. tall, much branched from the base, the secondary stems reclining; foliage and stems densely pubescent with white, crisped, spreading hairs; lower-most leaves linear oblanceolate, 3–5(7)-lobed, the upper ones reduced, becoming linear-ovate and clasping; heads numerous on short peduncles 3–20 mm. long; involucre hemispheric, 3–4

mm. high, 6–8 mm. across; bracts ca. 40, in 2–3 series, linear-lanceolate, densely pubescent with coarse, white, spreading hairs, this arising out of a lower strata of minute glandular trichomes; receptacle convex; ray florets white to pinkish, numerous (70–90), the ligules narrowly linear, ca. 0.3 mm. wide, 4–5 mm. long; disc florets yellow, numerous (100–150); corolla ca. 2 mm. long, 5-lobed, tube ca. 0.3 mm. long, throat ca. 2.7 mm. long, the lobes acute, ca. 0.3 mm. long; pappus of ray and disc florets similar, of 6–20 fragile setae, ca. 3 mm. long, these seemingly alternating with 6–10, well-developed, laciniate scales, 0.2–0.8 mm. long; style branches short, ca. 0.2 mm. long, with hispid, broadly acute appendages; achenes oval, ca. 1.2 mm. long, flattened, sparsely pubescent, the faces nerveless; chromosome number $n = 9$ pairs *(Turner 6010; Powell & Turner 2299)*.

Holotype (LL): Mexico: Coahuila, on gypsum flat just south of Hermanas. May 1, 1959. *D. S. Correll & I. M. Johnston 21291*.

Additional specimens examined: Coahuila, 5.3 km. S.W. of Rancho San Rafael (28°05′N, 103°42′W), Sept. 30, 1972, *M. C. Johnston et al. 9617b* (LL); 18 mi. E. of Cuatro Cienegas, May 20, 1972, *Powell & Turner 2270* (TEX); San Juan, Sept. 25, 1970, *Turner 6203* (TEX); 1 mi. S. of Estacion Hermanas, Apr. 4, 1970, *Turner 6010* (TEX); 20 mi. E. of Cuatro Cienegas, Mar. 30, 1971, *Turner 6344* (TEX).

Nuevo Leon, km. 100, highway between Monclova and Monterrey, Sept. 3, 1971, *Bacon et al. 1066* (TEX); just N. of Cañon de Potrerillos (26° 04′N, 100°45′W), Mar. 17, 1973, *M. C. Johnston et al. 10250A* (LL); 16 km. N. of Ranch Estacas (26°30′N, 100°30′W), Mar. 16, 1973, *M. C. Johnston et al. 10215C* (LL); 29.5 mi. S.E. of highway junction 53 and 57, road to Monterrey out of Monclova, May 22, 1972, *Powell & Turner 2299* (TEX).

A very distinctive gypsophile that mimics, with its low compact growth, *Townsendia mexicana*. It characteristically occurs in roadside ditches on hard-packed gypseous substrate.

The species presumably belongs to the Section *Olygotrichium* of *Erigeron* near *E. divergens*. The latter taxon is a more robust, larger-headed plant widespread in the southwestern U.S., extending into north-central Mexico just below trans-Pecos Texas where it occurs in sandy alluvial soils.

I have named the species for Dr. D. J. Pinkava, Professor at Arizona State University, who called to my attention its generic position (embarrassedly I must admit to having recognized it tentatively as a species of *Chaetopappa*).

Erigeron gypsophilus Turner, sp. nov. — Herbae parvae compactae perennes ad 10 cm. altae; caules solitarii vel plures e caudice profundo; flores radiati ca. 34 ligulis ca. 5 mm. longis 1 mm. latis supra albis subtus rosulatis vel utrinque rosulatis; flores disci 90–120, corollis ca. 2.5 mm. longis 5-lobatis flavis tubulis ca. 0.3 mm. longis; pappus disci radiorumque duplex setis 15–25 fragilibus ca. 2.5 mm. longis squamis-aliquot 0.1–0.2 mm. longis.

Small, compact, perennial herbs, 10 cm. tall or less, the stems 1-several from deep-seated rootstocks; foliage and stems gray-green, minutely appressed pubescent; lower-most leaves linear-oblanceolate, becoming progressively reduced and linear upwards; heads terminal on slender peduncles 1–4 cm. long; involucre hemispheric, 5 mm. high, 6–7 mm. across; bracts relatively fragile, ca. 40 in 2–3 series, linear lanceolate, sparsely pubescent with appressed hairs; receptacle convex; ray florets ca. 34, white above, pink beneath (or completely pink); ligules ca. 5 mm. long, 1 mm. wide; disc florets yellow, 90–120; corolla ca. 2.5 mm. long, 5-lobed; tube ca. 0.3 mm. long; pappus of ray and disc flowers similar, of 15–25 fragile bristles ca. 2.5 mm. long, these irregularly interspersed with short scales 0.1–0.2 mm. long; style branches short with triangular appendages; achenes oval, ca. 1.1 mm. long, flattened (the angles each forming a rib), sparsely pubescent to glabrate.

Holotype (LL): Mexico: Nuevo Leon, gypsum flats and ravines in open pinelands, about 3 mi. south of Galeana, July 20, 1958, *D. S. Correll & I. M. Johnston 19846.*

Additional specimens examined: Nuevo Leon, 15 mi. S.W. of Pueblo Galeana, May 21, 1934, *C. H. & M. T. Mueller 511* (TEX); 12.6 mi. E. of San Roberto Junction, Sept. 26, 1970. *B. L. Turner 6224* (TEX).

A very attractive, compact, gypsophile with dime-sized, white or pinkish heads. Because of the reduced "inner pappus" it might be technically placed in the section *Phalacroloma* of *Erigeron* as delimited by Cronquist (1947); on total characters, however, it seems more closely related to the gypsophilous *E. Pinkavii*, described above.

The type locality is at an elevation of ca. 2500 m. and is centered in a mountainous region of gypsum outcrops dominated by pines and junipers. To my knowledge, the two taxa described here are the only seemingly obligate species belonging to the genus in northern Mexico.

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STUDIES OF THE EUPHORBIA SPECIES OF THE CHIHUAHUAN DESERT REGION AND ADJACENT AREAS

MARSHALL C. JOHNSTON[1]

I present here keys to all the taxa of *Euphorbia* L. in the Chihuahuan Desert Region and a few new or noteworthy taxa of adjacent regions, with descriptions and distributional data on the new or noteworthy taxa. The material presented devolves from my continuing work on a *Chihuahuan Desert Flora* supported in part by the National Science Foundation under grant BMS-73-00898-AO1, which I acknowledge with gratitude.

All measurements reported here, unless otherwise noted, are made from dried material. The measurements of less than 1 mm. are made using a Bausch & Lomb 7-power comparator with a reticle scored to 0.1 mm. The measurements of the involucral glands and their appendages are made in a horizontal plane at the upper rim of the involucre and are said to be "radial" when they are taken along a line passing through the central axis of the involucre, and "tangential" when measured parallel to the periphery of the involucre. The measurements of seeds are said to be radial when measured from dorsum to venter in a plane passing through the central axis of the capsule, and tangential when made in a vertical plane passing from one side of the seed to the other.

KEY 1. Subgenera of Euphorbia

1. Involucral glands lacking petaloid appendages; leaves alternate or opposite, blades (at least those of mainstem) essentially bilaterally symmetrical (2).
   2. Involucral glands 4 or 5, nearly flat or convex ..... *Euphorbia* subgenus *Esula* (KEY 2).
   2. Involucral glands 1 or rarely up to 3 per cyathium, deeply cupped or even bilabiate. ..... *Euphorbia* subgenus *Poinsettia* (KEY 3).
1. Involucral glands with petaloid appendages, or if appendages absent then leaves all strictly opposite and not bilaterally symmetrical at least at base of blade (3).
   3. Stipules (on new, leafy shoots) minute and glandlike or obsolete ..... *Euphorbia* subgenus *Agaloma* (KEY 4).
   3. Stipules (on new, leafy shoots) small but dorsiventrally compressed and bladelike, not glandlike or obsolete ..... *Euphorbia* subgenus *Chamaesyce* (KEY 5).

KEY 2. Species of Euphorbia subgenus Esula Persoon

1. Foliage densely pubescent or papillose-pubescent (use strong lens!) (2).
   2. Foliage very densely and minutely pubescent with translucent hairs less than 0.1 mm. long (3)
      3. Stems glabrous ..... 4. *E. Pinkavana* M.C. Johnst.
      3. Stems pubescent like the leaves ..... 8. *E. Ivanjohnstonii* M.C. Johnst.
   2. Foliage with longer hairs (4)
      4. Hairs not branched (5)
         5. Pubescence a tomentum; petioles of stem-leaves 0.5–1 mm. long; glands tangentially 0.8–1.0 mm. long ..... 1. *E. cressoides* M.C. Johnst.
         5. Pubescence not dense enough to be called a tomentum; petioles of stem-leaves 1.0–2.5 mm. long; glands tangentially only 0.4–0.5 mm. long ..... 2. *E. Mcvaughiana* M.C. Johnst.

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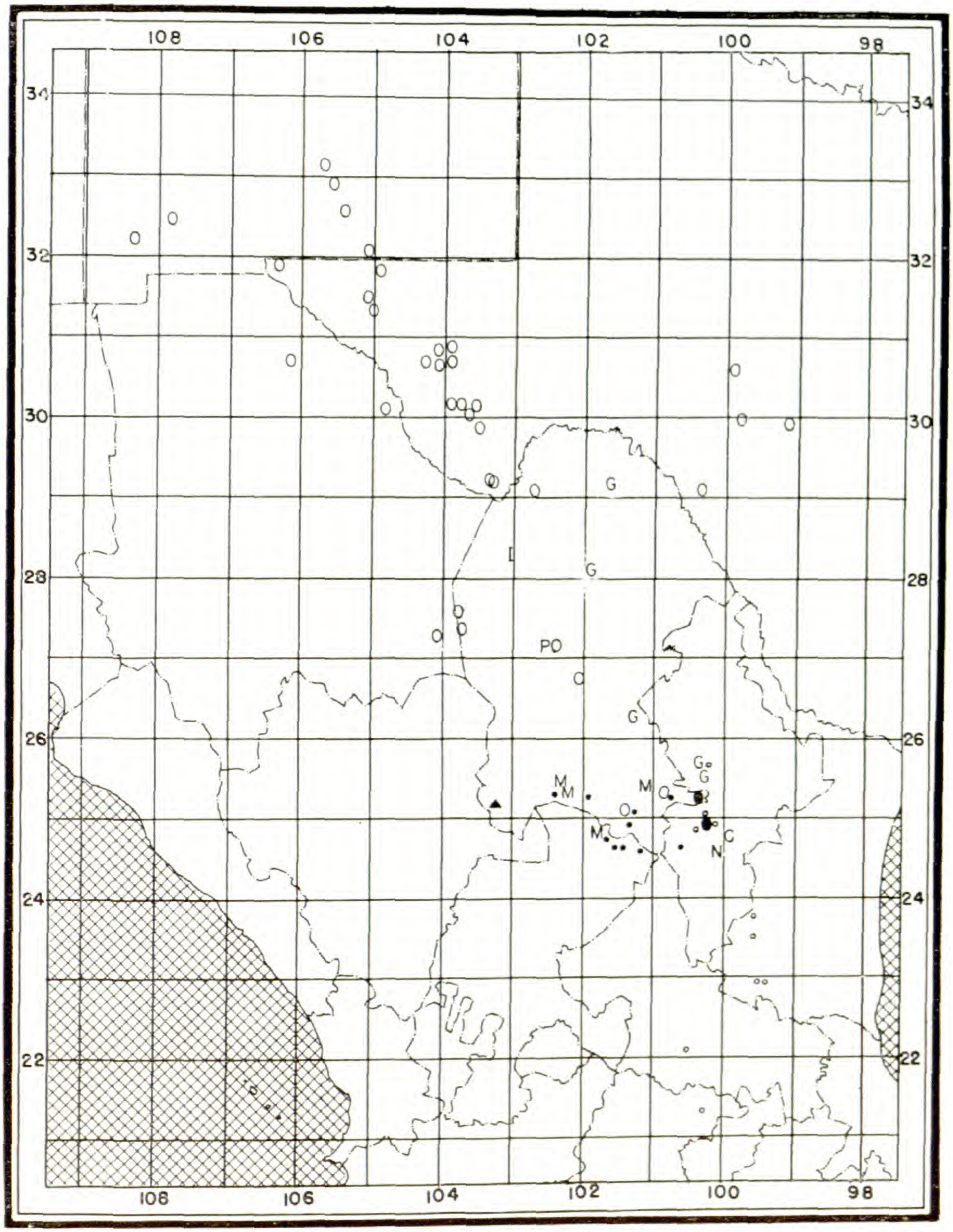

Fig. 7. Distribution of some taxa of *Euphorbia* subgenus *Esula* in the Chihuahuan Desert Region and adjacent regions, C, *E. Correllii;* G, *E. brachycera* var. *Greggii;* I, *E. Ivanjohnstonii;* M, *E. Mcvaughiana;* N, *E. Neilmulleri;* O, *E. brachycera* var. *brachycera;* P, *E. Pinkavana;* large filled oval, *E. Beamanii;* triangle, *E. cressoides;* small circles, *E. furcillata* var. *furcillata;* small disks, *E. furcillata* var. *Ribana.*

4. Hairs, at least many of them, branched ..... 3. *E. Neilmulleri* M.C. Johnst.

1. Foliage essentially glabrous or very sparsely pubescent (5)
5. Annuals from slender taproots (6)
6. Fruits smooth; each of the two ventral facets of the seeds with a single elongate pit or depression; leaves entire. ..... 10. *E. Pepl'd'on* Engelm.
6. Fruits warty; seeds with sharp, irregular, reticulate ridges all over; leaves serrulate ..... 11. *E. spathulata* Lamarck

5. Perennial herbs or subshrubs (7)
7. Upper stem-leaves at least 10 mm. long, often several cm. long (8)
8. Stem-internodes (0.5–) 1–2 (–4) mm. long, averaging less than 2 mm.; lower stem after leaf-fall marked by prominent dark leaf-scars (9)
9. Upper stem-leaves oblanceolate 15–25 mm. long, 5–9 mm. broad, usually only about 3 times as long as broad ..... 5. *E. Beamanii* M.C. Johnst.
9. Upper stem-leaves oblanceolate to lance-linear to narrowly lanceolate, (10–) 15–30 (–40) mm. long, (2–) 3–4 (–7) mm. broad, usually at least 5 to 10 times as long as broad. ..... 6. *E furc:llata* H.B.K.
8. Stem-internodes (2–) 3–10 (–16) mm. long, even in the lower part averaging more than 2 mm.; lower stem after leaf-fall not strongly marked by dark gland-like leaf-scars. ..... 7. *E. brachycera* Engelm.
7 Upper stem-leaves 6–8 mm. long. ..... 9. *E. Correllii* M.C. Johnst.

The North American species of this subgenus have been taxonomically neglected almost as thoroughly as those of subgenus *Agaloma* (Raf.) House, but not quite. Subsequent to the treatment of the entire genus by Boissier (1862), the United States species were treated by Norton (1899). The Mexican species have not been treated as a whole since 1862 except for those of the Sonoran Desert (Wiggins, 1964). Thus it is not unexpected that the species of northern Mexico, though few and not especially difficult taxonomically, are little known and include some undescribed species.

The descriptions of members of subgenus *Esula*, to be sufficiently informative, require more verbiage than those of any of the other subgenera, owing to the diversity of the foliage. The stem-leaves have alternate phyllotaxy and among them the lower ones are dissimilar to the upper ones. The leaves at the base of the umbel ("pleiochasium" is needlessly long and no more informative) are whorled and of a different shape. The bracteal ones of the rays and their forks are opposite and have still another form. Since leaf-form and -size appear to be of value taxonomically in this group, work in it is made difficult by the omission of some of this crucial information in older descriptions. On the other hand, much has been made in the past of the precise length and curvature of the gland-horns of the perennial species, and the real or fancied crenae or teeth of the glands between the horns. These characters vary a good deal with the maturity of the cyathium and within and between populations, and great care is required in their diagnostic use. The subgenus *Esula*, like *Agaloma*, awaits a careful, resourceful and ambitious monographer to clarify many of the problems.

The distributions of some members of this subgenus are shown in Fig. 7.

Euphorbia cressoides M. C. Johnst., sp. nov. – Herbae perennes dense pubescentes 15–20 cm. altae, basis caulis perennis verticalis 2–3 mm. crassis fuscus; caules hornotini numerosi e plano terrae adscendentes subsimplices incano-tomentosi pilis translucentibus simplicibus inaequalibus retrorse inclinatis crispatis 0.2–0.3 (–0.5) mm. longis internodiis 1–3 (–4) mm. longis; umbella (1 tantum visa) 4-radiata radiis 15 mm. longis bifidis pubescentibus ut in caulibus; folia integra exstipulata dense incano-pubescentia pilis translucentibus simplicibus inaequalibus effusis vel irregulariter implexis crispatis ad marginem 0.1–0.2 mm. longis ad paginam 0.2–0.5 mm. longis; folia caulium alterna effusa, inferiora late elliptica 3.5–6.5 mm. longa 2.5–3.5 mm. lata obtusa vel rotundata mucronata, superiora ovata 6–10 mm. longa 4–6.5 mm. lata acuta vel obtusa mucronata, petioli 0.5–1.0 mm. longi; folia umbellae verticillata ovata 7–8 mm. longa 4.2–4.8 mm. lata obtusa mucronata fere sessilia; folia radiorum opposita ovata 3.5–5.0 mm. longa 2.5–4.5 mm. lata acuta vel obtusa mucronata fere sessilia; pedunculi ca. 0.3 mm. longi; involucra urceolata ca. 1.3 mm. longa interne glabra externe pubescentia; glandulae 4 tangentialiter 0.8–1.0 radialiter 0.4–0.6 mm. longae minutissime rugulosae in sicco testaceae, cornua glandis 2 erecta vel effusa 0.3–0.5 mm. longa; flores staminati 20–25; flores pistillati ut videtur nulli.

Mexico: Coahuila, Sierra de Jimulco approached from the South at Mina San José 8 km. NE. of Estacion Otto, 25°8′ N. lat., 103°13′30″ W. long., ca. 3000 m. alt., rare in chaparral on hard mineralized limestone, Sep. 27, 1972, *M. C. Johnston, T. L. Wendt & F. Chiang 9551i* (TEX, holotype).

The name was suggested by B. L. Turner on the basis of a resemblance to *Cressa truxillensis* H.B.K.

The single collection, actually taken by Tom Wendt alone, is so distinctive that I have no hesitation in describing it as a new species. It has an obvious relationship to *E. Mcvaughiana* M. C. Johnst., which occurs only 100 km. to the East on the Sierra de Parras. It shares with *E. Mcvaughiana* the apparent absence of pistillate flowers. But again the single umbel is not well developed and I am confident that further exploration will fill this gap in our knowledge.

The Sierra de Jimulco is a massive range with an extensive area nearly 3000 m. in altitude. It is very poorly known, especially in the higher parts which present considerable logistical difficulties to the explorer. The few hundred collections now known from the range include several new taxa and some very rare and interesting plants.

Euphorbia Mcvaughiana M. C. Johnst., sp. nov. – Herbae perennes pubescentes 2–3 dm. altae; radix ca. 5–7 mm. crassa; corona sublignea; caules 20–40 adscendentes subsimplices partibus inferis rubiginosis per arthesin pro parte efoliatis internodiis (1–) 2–5 (–10) mm. longis dense pubescentes pilis effusis translucentibus simplicibus crispatis inaequalibus 0.1–0.3 (–0.4) mm. longis; umbella 3-radiata radiis 1–3 cm. longis simplicibus vel 1–2-bifidis pubescentibus ut in caulibus; folia integra exstipulata pubescentia pilis translucentibus crispatis 0.1–0.3 mm. vel in costa

0.3–0.4 mm. longis; folia caulium alterna adscendentia vel effusa, inferiora ovata vel late elliptica vel raro obovata (2–) 4–6 (–8) mm. longa, (1–) 2–4 (–5) mm. lata acuta obtusave mucronata, superiora ovata vel elliptica 5–15 mm. longa, 4–7 mm. lata acuta obtusave mucronata, petioli 1–2.5 mm. longi; folia umbellae verticillata ovata vel obovata 4–10 mm. longa, 3–7 mm. lata saepe acuta fere sessilia; folia radiorum opposita late deltoideo-ovata vel deltoideo-reniformia 3–4 mm. longa lataque saepe acuta fere sessilia; pedunculi 0.3–0.5 mm. longi; involucra urceolato-cylindrica 1–1.3 mm. longa interne glabra externe sparse pubescentia; glandulae 4, tangentialiter 0.4–0.5 radialiter 0.3–0.4 mm. longae minutissime rugulosae in sicco testaceae, cornua glandis 2, 0.2–0.3 mm. longa erecta effusave; flores staminati ca. 25 antheris stramineis; flores pistillati ut videtur nulli.

Mexico: Coahuila, 9 km. south of Parras on Sierras Negras, "2400 m.," scrubby woodland association of pine, juniper, oaks, heavily grazed by goats, Jul. 3, 1941, *L. R. Stanford, K. L. Retherford and R. D. Northcraft 220* (TEX, holotype; MO, WTU, isotypes).

Presumably, the "Sierras Negras" of this label are the "Sierra Prieta" of modern maps; the locality is near 25°22′ N. lat., 120°14′ W. long., the altitude more than 2,000 m., and the substrate probably a metamorphosed calcareous rock.

Other specimens seen: Coahuila, ca. 6 km. (airline) west of Saltillo, eastern extremity of the Sierra de la Vega, at Estacion Microondas La Vega, 25°25′ N. lat., 101°05′ W. long., 2000 m., rare in rosette-scrub with some chaparral species, on steep slopes of metamorphosed shaly limestone, Mar. 30, 1973, *M. C. Johnston, T. L. Wendt*, and *F. Chiang 10500b* (TEX, unicate); Sierra de Parras, 25°24′ N. lat., 102°19′ W. long., 2100 m., rare in chaparral on calcareous gravel, May 14, 1973, *Johnston et al. 10995* with H. S. Gentry and R. Engard (TEX, unicate). Zacatecas, 18 km. west of Concepcion del Oro, 24°54′ N. lat., 101°45′ W. long., 2850 m., bare sandstone outcroppings covered with low brush and herbs, Jul. 24, 1941, *L. R. Stanford, K. L. Retherford and R. D. Northcraft 592* (MO, WTU).

One of the most striking features of the specimens seen is the absence of even a rudimentary pistillate flower in the cyathia examined. The specimens are all rather young with poorly developed umbels. Presumably pistillate flowers will be found on specimens taken later in a favorable growing season.

Euphorbia Mcvaughiana is related to the even more narrowly endemic *E. cressoides* and *E. Neilmulleri*, but beyond this it is hazardous to speculate. The form of the glands and the habit seem to point to the entire complex of perennial species treated here, but to no single species more directly than to another.

The name is intended to honor Professor Rogers McVaugh (born 1909) of The University of Michigan. Among his many prodigious botanical works, he (1961) has elaborated the Euphorbiaceae of "Nueva Galicia", southwestern Mexico. This distinctive species is chosen for dedication to him, to commemorate his name in the genus *Euphorbia*.

Euphorbia Neilmulleri M. C. Johnst., sp. nov. – Herbae perennes vel suffrutices dense pubescentes 1–2 (–4) dm. altae; radix 3–8 mm. crassa; corona lignea 5–10 mm. crassa; caules hornotini 10–20 e plano terrae subsimplices adscendentes incanotomentosi pilis implexis translucentibus crispatis ramosis vel dendriticis (0.1–) 0.2–0.3 mm. longis, internodiis (1–) 2–3 (–4) mm. longis; cyma vel umbella 2–3-radiata radiis 1–3 cm. longis 1–2-bifidis pubescentibus ut in caulibus; folia integra exstipulata tomentosa ut in caulibus in sicco leviter involuta; folia caulium alterna adscendentia vel effusa, inferiora anguste obovata 4–6 mm. longa 1.5–3 mm. lata saepe acuta mucronata, superiora lanceo-obovata vel anguste elliptica 6–10 mm. longa 2.3–3.3 mm. lata acuta mucronata, petioli ca. 0.2 mm. longi vel nulli; folia basalia inflorescentiae verticillata vel opposita obovata vel oblongo-elliptica 5–9 mm. longa 3–4 mm. lata acuta mucronata sessilia; folia radiorum opposita obovata vel rhombeo-elliptica 3–6 mm. longa 2–3.5 mm. lata acuta sessilia; pedunculi 0.2–0.5 mm. longi tomentosi; involucra urceolata 1.2–1.9 mm. longa interne glabra (praeter lobos) externe tomentosa; glandulae 4 tangentialiter 0.6–0.9 mm. radialiter 0.3–0.4 mm. longae minutissime rugulosae in sicco testaceae; cornua glandis 2 ca. 0.2 mm. longa saepe decurvata interdum ut videtur obsoleta; flores staminati 15–20 antheris flavis; flores pistillati longi- vel breviexserti; styli 3, 0.8–1.0 mm. longi ad medium bifidi; capsula dense demum sparse tomentosa 2.5–2.8 mm. longa; semina oblongo-ovoidea, 2.0–2.2 mm. longa badia irregulariter foveolata; caruncula subconica 0.2–0.3 mm. longa.

Mexico: Nuevo Leon, Sierra Madre Oriental, foothills "below" Pablillo, "sparse," 1934, *C. H. & M. T. Mueller 501* (TEX, holotype).

The locality is near 24°34′ N. lat., 99°58′ W. long., although the collectors state that it is southwest of Galeana, it is slightly east of south from Galeana. The collectors give the altitude as 2300–2400 m., but the terrain near Pablillo averages lower than that, about 2000 m.

Other collections seen: Nuevo Leon, Encinal to Pablillo through "cedar" *(Juniperus)* scrub, "sparse on Bulbilis" (*Buchloe* meadows), 24°35′ N. lat., 100°02′ W. long., 2000 m., Jul. 18, 1934, *C. H.* and *M. T. Mueller 1048* (TEX); on gypsum slopes in open pinelands 3 km. south of Pablillo, 24°35′ N. lat., 100° W. long., July 20, 1958, *D. S. Correll and I. M. Johnston 19896* (LL); 0.5 km. north of Pablillo, 24°35′ N. lat., 99°59′ W. long., 2100 m., *Pinus, Juniperus, Quercus, Rhus*, etc. on rolling karst upland with gypseous limestone, May 17, 1973, *M. C. Johnston, T. L. Wendt and F. Chiang 11049* (TEX).

The Pablillo area boasts several endemic taxa, mostly on the gypsum and gypseous limestone common in the area.

Euphorbia Neilmulleri may possibly be related to *E. Mcvaughiana* and *E. cressoides*, but it is quite distinct from all other species. The two 1934 collections were misdetermined as *E. longecornuta* Watson, which is related somewhat to *E. brachycera* and not at all close to the present species.

The name is intended to honor Professor Cornelius Herman Muller (born Mueller in 1909) of the University of California at Santa Barbara and The University of Texas at Austin, whose pioneer collecting made

known a large portion of the exceedingly rich endemic flora of the Sierra Madre Oriental.

Euphorbia Pinkavana M. C. Johnst., sp. nov. – Herbae perennes 15–25 cm. altae; radix 3–5 mm. crassa, corona sublignea 5–10 mm. crassa; caules e corona plures glabri proximaliter recumbentes castanei distaliter erecti virides infra medium per anthesin exfoliati cicatricibus foliorum nigris prominentibus multis internodiis 1–3 mm. longis; umbella compacta 3–5-radiata radiis 1–2 cm. longis glabris 1–2-bifidis saepe proliferis; folia integra exstipulata dense microscopice papilloso-pubescentia unusquisque cellularum papilla 0.01–0.03 mm. longa lataque; folia caulium alterna adscendentia vel saepe effusa conferta, inferiora anguste obovata vel elliptico-obovata 5–10 mm. longa 2–3 mm. lata acuta mucronata, superiora oblanceolata 15–25 mm. longa 3–5 mm. lata acuta mucronata, petioli 0.3–1 mm. longi; folia umbellae verticillata anguste ovata vel anguste obovata 6–9 mm. longa 3.5–4.8 mm. lata acuta mucronata sessilia; folia radiorum opposita late ovata vel late obovata 4–6 mm. longa 3–5 mm. lata mucronata sessilia; pedunculi ca. 0.5 mm. longi; involucra subcylindrico-campanulata ca. 2 mm. longa interne pubescentia externe papilloso-pubescentia; glandulae 4 tangentialiter 1 mm. radialiter 0.8 mm. longae superficies peripheralis in sicco brunneipapillata; cornua glandis 2 ca. 0.5 mm. longa straminea decurvata; flores staminati ca. 25, antheris stramineis; flores pistillati longiexserti; styli capsulae seminaque non visa; columella 2.2 mm. longa.

Mexico: Coahuila, Sierra de la Madera, north side, upper part of Canon de la Hacienda, 27°02′30″ N. lat., 102°26′30″ W. long., 2550 m., May 10, 1973, *M. C. Johnston, T. L. Wendt and F. Chiang 10958* (TEX, holotype; isotypes to be distributed). The only other specimen seen is from the same canyon but at 2700 m. altitude, Aug. 5, 1973, *J. Henrickson and T. L. Wendt 11940* (TEX). This is a forested canyon in a massive limestone range, the vegetation at this elevation including species of *Quercus, Pinus, Pseudotsuga, Abelia, Cercocarpus, Chrysactinia, Arctostaphylos, Nolina,* etc.

Euphorbia Pinkavana seems allied to *E. furcillata* var. *furcillata*, being distinguished chiefly by the low stature, broad glands and the papillose indument.

The name is intended to honor Dr. Donald John Pinkava (born 1933) of Arizona State University, an avid student of the flora of the Cuatro Cienegas Region, which includes the Sierra de la Madera.

Euphorbia Beamanii M. C. Johnst., sp. nov. – Herbae perennes glabrae 2–3 (–5) dm. altae; radix ignota; bases caulium geniculatae sublignosae 1–2 cm. longae 3–5 mm. crassae nigrescentes rugulosae foliis squamiformibus confertis adpressis persistentibus ovatis acutis 2–4 mm. longis; caules solitarii vel pauci sparse ramosi erecti 2–5 mm. crassi in sicco striati infima saepe atrovinosi aphyllique cicatricibus foliorum nigris prominentibus multis internodiis 1–2 mm. longis; umbella 5-radiata compactissima radiis 1–3 cm. longis simplicibus vel saepe bifidis; folia integra sessilia exstipulata; folia caulium alterna adpressa vel adscendentia, inferiora anguste obovata 7–10 mm. longa, 4–5 mm. lata superiora oblanceolata 15–25 mm.

longa, 5–9 mm. lata; folia umbellae 5 verticillata ovatirhombea vel obovatirhombea 10–18 mm. longa 10–12 mm. lata; folia radiorum opposita late ovata vel anguste reniformia 5–10 mm. longa 5–13 mm. lata; pedunculi 1–2 mm. longi crassi; involucra sybcylindrico-campanulata ca. 2 mm. longa interne pubescentia; glandulae 4 tangentialiter 1–1.5 mm. radialiter 0.5–1 mm., superficies plana peripheralis in sicco brunneipapillata; cornua glandis 2 ca. 0.5 mm. longa deorsum recurvata; flores staminati ca. 25, antheris albis; flores pistillati longiexserti, styli 1–2 mm. longi partibus basalibus coalescentibus 0.2–0.5 mm. longis ramis 3 ad medium bifidis; capsulae 3–3.5 mm. longae irregulariter minute rugulosae; semina cylindraceo-ovoidea 2.1–2.2 mm. longa brunneigrisea irregulariter foveolata; caruncula semiconica brunnea ca. 0.5 mm. longa.

Mexico: Nuevo Leon, Cerro Potosi, 24°52′30″ N. lat., 100°14′ W. long., 3,200 m., June 18, 1966, *L. Gilbert 2* (TEX, holotype); Cerro Potosi, 3,750 m., *Gilbert 31* and *73* (TEX); southeastern side of Cerro Potosi above Ejido 18 de Marzo, 2,940 m., June 25, 1960, *J. H. Beaman 3316* (MSC, TEX); near peak of Cerro Potosi, 3,600 m., July 23, 1938, *Univ. Ill. Mex. Biol. Exp. 952* (MO); peak of Cerro Potosi, Jul. 21, 1935, *C. H. Mueller 2263* (MO); top of Cerro Potosi, 3,650 m., Jul. 1, 1959, *J. Beaman 2636* (MSC); Cerro Potosi, 3,350 m., May 2, 1969, *Hinton, et al. 17003* (MSC); northwestern summit of Cerro Potosi, 3,700 m., in alpine meadow, Jan. 2, 1963, *J. W. Andresen and R. J. Steinhoff 2064* (MSC). Coahuila, northern slope of Sierra de Santa Marta southeast of La Ciruela, 25°13′ N. lat., 100°25′ W. long., 2,800–3,500 m., Feb. 12, 1974, *T. F. Patterson 1003* with D. H. Riskind (LL); mountainsides southeast of Saltillo, Jun. 12, 1935, *O. M. Clark 6748* (MO).

Euphorbia Beamanii is related to *E. furcillata* but perfectly distinct. No intermediates are known.

The name is intended to honor Dr. John Homer Beaman (born 1929), of Michigan State University, able and enthusiastic worker on high-altitude floras of Mexico and Central America.

Euphorbia furcillata H.B.K., Nov. Gen. et Sp. 2: 60. 1817.

This species can be divided into at least two varieties, as in this key.

1. Suffrutex with taproot, the plant bushy-branched above ground-level; alternate leaves below inflorescence narrowly oblanceolate with the widest part in the distal half, with petioles 0.5–1.5 mm. long; whorled leaves elliptic to lance-elliptic ..... *E. furcillata* var. *furcillata*

1. Perennial herbs; base of plant somewhat rhizome-like with branching below ground as well as near ground level; alternate leaves below the inflorescence lance-linear to narrowly lanceolate, the widest part in the proximal half, with petioles 0–0.5 mm. long; whorled leaves lance-ovate ..... *E. furcillata* var. *Ribana* M. C. Johnst.

Euphorbia furcillata var. **furcillata** – *Euphorbia campestris* Chamisso & Schlechtendal, Linnaea 5: 84. 1830. ?*Euphorbia esuliformis* S. Schauer, Linnaea 20: 729. 1847. *Tithymalus campester* (Chamisso & Schlechtendal) Klotzsch & Garcke, Linne's Naturl. Pflanzenkl. Triccocae, p. 86. 1859. ?*Euphorbia campestris* var. *esuliformis* (Schauer) Boiss., DC. Prodr. 15 (2): 147. 1862. *Euphorbia campestris* var. *foliosa* Millspaugh, Bull. Torrey Bot. Club 16: 66. 1889.

The variety *furcillata* occurs at scattered localities from Guatemala and Chiapas to Guanajuato, San Luis Potosi and Nuevo Leon. (Specimens from the Nevada de Colima in Jalisco seem to represent an undescribed variety.) The type was from the mountains of the state of Hidalgo, and was illustrated by Boissier (1856, *t 98*) and redescribed by him (1862) on the basis of the original Humboldt and Bonpland collections at Berlin. Although the description and illustration are not of a typical member of the taxon that has long been called *E. campestris* in herbaria, they match the upper branches of such depauperate or starved specimens of *E. campestris* as for example *Rzedowski 16929* from Cerro Tecajete, Hidalgo, in the peculiarly small, ascending leaves. The whorled leaves of the Humboldt and Bonpland collections were incorrectly described by Boissier (1862) as ovate-rhombic, whereas in fact they are elliptic like those of *E. campestris*. Boissier himself suggested that *E. furcillata* might be merely a form of *E. campestris*. Dr. John Beaman (personal communication), who has studied the subgenus *Esula* in the high Mexican mountains, has already begun to use the earlier name *E. furcillata* in place of *E. campestris*.

Various collections from the United States have been referred to *E. campestris*. For example, Boissier (1862) through error cites *Wright exs. 1820* from New Mexico, although that collection is the type of his own *E. chamaesula* Boiss. Norton (1899) cites Wright collections from Texas, adding that they are "too near *brachycera*", to which species I refer them. In fact, Norton's *E. campestris* is a confused congeries that bears small resemblance to the purged concept of *E. furcillata* var. *furcillata* proposed here.

Euphorbia furcillata var. **Ribana** M. C. Johnst., var. nov. — Herbae 3–6 (–10) dm. altae; radix ignota; basis caulis 3–7 mm. crassis badia vel castanea saepe profunde infossa adscendente rhizomatiformis, caulibus secundariis multis non confertis ad planum terrae caulibus tertiis adscendentibus; pars caulis aeria infra inflorescentiam 1.7–3 (–4) mm. crassa; folia caulis inferiora lanceo-linearia 5–10 mm. longa, 1–2 mm. lata superiora lanceo-linearia vel anguste lanceolata (10–) 15–30 (–40) mm. longa (2–) 3–4 (–9) mm. lata acutissima mucronata; petioli 0–0.5 mm. longi vel nulli; folia verticillata umbellae lanceo-ovata 11–21 (–24) mm. longa, (6-) 8–10 (–15) mm. lata, saepe acuminata acutissima; involucrum 1.5–2 mm. longum; glandulae tangentialiter 0.8–1.1 mm. radialiter 0.4–0.5 mm. longae; capsulae 2.9–3.2 mm. longae; semina 2.2–2.3 mm. longa.

Mexico: Nuevo Leon, 0.5 km. northwest of Rancho Zaragoza, 4 km. east of El Barrosito, 24°36′ N. lat., 100°36′ W. long., 2,050 m., in desertic scrub with *Yucca filifera* Carr., *Y. carnerosana* (Trel.) McKelv., *Larrea tridentata* (DC.) Coville, *Ziziphus Lloydii* (Standl.) M. C. Johnst., etc., in calcareous gravel, June 19, 1972, *M. C. Johnston, F. Chiang and T. L. Wendt 8025* (TEX, holotype; isotypes to be distributed). Coahuila, 60 km. southwest of Saltillo at Rancho Los Angeles, 1800 m., June 15, 1952, *F. W. Gould 6366* (TEX); 24 km. northwest of Fraile, 25°3′ N. lat., 101°18′ W. long., 2,500 m., mountain, oak-juniper association, July 15, 1941, *L. R. Stanford, K. L. Retherford and R. D. Northcraft 369* (MO,

WTU); Sierra Pata Galana, 25°15′ N. lat., 101°50′ W. long., March 1905, *C. A. Purpus 1099* (MO); between San Antonio de las Alazanas and San Miguel, Sep. 3, 1848, *J. Gregg 426* (MO). Zacatecas, Sierra del Astillero, 5 km. northeast of Guadalupe Garceron, 24°37′ N. lat., 101°08′ W. long., 2,200 m., Sep. 22, 1973, *J. Henrickson 13327* (TEX); eastern outskirts of Mazapil on road to Salaverna, 24°38′ N. lat., 101°33′ W. long., 2,300 m., June 17, 1972, *M. C. Johnston, et al. 7932* (TEX); 11 km. by road west of Concepcion del Oro, 24°37′ N. lat., 101°27′ W. long., 2,400 m., Aug. 30, 1971, *Henrickson 6284* (TEX); 15 km. west of Concepcion del Oro, 24° 54′ N. lat., 101°45′ W. long., 2,300 m., valley floor, July 19, 1941, *Stanford, et al. 481* (MO, WTU).

Variety *Ribana* occurs in much drier habitats than those characteristic for var. *furcillata*. Populations of var. *furcillata* have been found at altitudes higher than any known for var. *Ribana*, but the average altitudes for the two varieties are probably rather similar. The distribution of var. *Ribana* is in the higher southern part of the Chihuahuan Desert Region, west of the Sierra Madre Oriental, whereas var. *furcillata* is basically a plant of the Sierra Madre Oriental. Plants of var. *Ribana* sometimes have a strong resemblance to those of *E. brachycera*, especially the var. *brachycera*. No doubt there is a close relationship between these two taxa, but it would be extremely difficult to postulate that this relationship is closer than, for example, that of *E. furcillata* to *E. chamaesula*, or of the latter to *E. brachycera*.

The name is intended to honor Ramon Riba y Nava Esparza (born April 24, 1934), able curator of the Herbarium of the Institute of Biology, National University of Mexico.

Euphorbia brachycera Engelm. var. **Greggii** (Boiss.) M. C. Johnst., comb. nov. — Based on *Euphorbia Greggii* Engelm. ex. Boiss., DC. Prodr. 15(2): 147. 1862.

Euphorbia Ivanjohnstonii M. C. Johnst., sp. nov. — Herbae perennes (15–) 20–30 cm. altae; radix 3–7 mm. crassa, corona sublignea 3–7 mm. crassa; caules e corona plures adscendentes internodiis (1–) 2–3 (–5) mm. longis dense minute pubescentibus pilis translucentibus erectis 0.02–0.07 mm. longis; umbella 3–5-radiata radiis 2–6 cm. longis 1–2-bifidis pubescentibus similibus caulibus; folia integra exstipulata densissime pubescentes pilis effusis antrorsisve 0.03–0.08 mm. longis vel in centro laminae ad 0.1 mm. longis; folia caulium alterna effusa conferta, inferiora lanceo-elliptica 4–10 mm. longa 2–2.5 mm. lata acuta, superiora lanceo-ovata 7–15 mm. longa 5–6 mm. lata acuta, petioli ca. 0.5 mm. longi; folia umbellae verticillata lanceo-ovata 8–12 mm. longa 5–6 mm. lata sessilia; folia radiorum opposita ovata 5–7 mm. longa 2.5–4.5 mm. lata acuta sessilia; pedunculi 0.3–0.7 mm. longi; involucra subcylindrico-campanulata 1.0–1.8 mm. longa interne pubescentia externe papilloso-pubescentia; glandulae 4 tangentialiter 0.5–0.6 mm. radialiter 0.2–0.3 mm. longae minutissime rugulosae in sicco brunneae; cornua glandis saepe 2, 0.2–0.3 mm. longa erecta decurvatave; flores staminati ca. 20 antheris flavis; flores pistillati; capsulae seminaque non visa.

Mexico: Coahuila, Sierra Santa Fe del Pino, near and just west of the highest peaks in a broad canyon between the two main ridges, 28°14′30″ N. lat., 103°02′ W. long., 2,500 m. alt., May 26, 1973, *M. C. Johnston, T. L. Wendt and F. Chiang 11237* (TEX, holotype; isotypes to be distributed).

The name is intended to honor the memory of Ivan Murray Johnston (1898–1960), whose pioneer botanical work in the Chihuahuan Desert Region was regrettably never completed, but who has left us a priceless legacy of research materials.

The only other collection seen is from the same range, called by the collectors "Sierra del Pino", in the vicinity of La Noria, Aug. 20–26, 1940, *I. M. Johnston & C. H. Muller 512* (TEX).

This massive range is largely of limestone and the main part consists of two long north-trending parallel ridges separated by a picturesque valley about 3 km. wide and approachable from the south or north end. The valley is extensively forested with *Pinus ponderosa* and mixtures of oaks and pinons, and the ridges support dense chaparral. The range, though scarcely touched botanically, has yielded several novelties and will doubtless repay further exploration.

Euphorbia Ivanjohnstonii is presumably related to the variable *E. brachycera* but differs in the highly distinctive indument, the compact, almost ericoid habit with small leaves, the very small glands and gland-horns and the narrow ray-leaves. I feel no hesitation in describing it as new even in the absence of the capsules and seeds.

Euphorbia Correllii M. C. Johnst., sp. nov. — Herbae perennes 9–12 cm. altae glabrae aliquantum glaucae punctis gypseoarenaceis notata; radix ignota; bases caulium subterranea brunnea 1.7–3 mm. crassa rhizomatiformes; caules horotini plures erecti 0.7–1.6 mm. crassi castanei ramosique ad planum soli, in parte superiori simplices virides internodiis 0.2–1.5 (–2.5) mm. longis, cicatricibus foliorum nigrescentibus prominentibus; umbella 2–3-radiata diffusa radiis 2–4 cm. longis 1–3-bifidis; folia integra exstipulata in sicco rugosa (in vivo succulenta?), folia caulium alterna adscendentia acuta inferiora lineari-lanceolata 4–7 mm. longa 1.1–2.2 mm. lata, superiora anguste elliptico-ovata 6–8 mm. longa 2.5–4 mm. lata, petioli 0.1–0.2 mm. longi vel nulli; folia umbella verticillata late rhombeo-ovata vel rhombea 4.8–5.5 mm. lata sessilia; folia radiorum opposita rhombeo-orbicularia vel anguste reniformia 2.0–3.3 mm. longa 2.0–5.0 mm. lata sessilia; pedunculi 0.2–0.3 mm. longi interne pubescentia; glandulae 4 tangentialiter 0.6–0.8 mm. radialiter ca. 0.3 mm. longae minutissime rugulosae in sicco brunneae; cornua nulla; flores staminati 10–15; flores pistillati longiexserti; styli 3, 0.4–0.5 mm. longi unusquisque stigmatibus 2 sphaeroideis; capsulae 2.3–2.5 mm. longae; semina ovoidea ca. 1.9 mm. longa texta interiore badia leviter foveolata exteriore albida microreticulata.

Mexico: Nuevo Leon, 5 km. east of Entronque Gleana, gypsum flat in valley, 24°45′ N. lat., 100°00′ W. long., ca. 1,600 m. alt., July 21, 1958, *D. S. Correll & I. M. Johnston 19959* (holotype, TEX). The collectors

note on the label that only one plant was seen; presumably they collected it.

Euphorbia Correllii is one of the numerous narrowly edaphically restricted endemics on gypsum in the Galeana-Pablillo-San Roberto region of Nuevo Leon. It may possibly be related to *E. brachycera*, but is distinctive in several ways from all other species.

The name is intended to honor Donovan Stewart Correll (born 1908), master botanist and treasured friend, currently at Fairchild Tropical Gardens, Miami.

KEY 3. Species of Euphorbia subgenus Poinsettia (Graham) House

1. Stem solitary from annual taproot; shcots solitary or uniform; capsules 2–4 mm. long (2)
   2. Leaves below the bracts mostly alternate, the stem glabrous or with simple pubescence; seeds mostly (2.7–) 3.0–3.5 mm. long (3)
      3. Gland circular with circular depression ca. 0.5 mm. in diameter; seeds with a dorsal keel and 2 lateral angles. ..... 13. *E. heterophylla* L.
      3. Gland bilabiate, oblong, ca. 1.0 mm. long tangentially; seeds not strongly angular in transection. ..... 14. *E. cyathophora* Murray
   2. Leaves below the bracts mostly opposite, the stems usually with a double pubescence of minute retrorse hairs and longer spreading multicellular ones; seeds mostly 2.6–2.8 (-3.1) mm. long ..... 15. *E. dentata* Michaux
1. Stems 5–20 from tuberous perennial roots; shoots dimorphic, the vernal ones wih flowers and only bracteal leaves, the aestival shoots leafy; capsules 5–6 mm. long. ..... 12. *E. radians* Bentham

KEY 4. Species of Euphorbia subgenus Agaloma (Rafinesque) House

1 Annual or perennial herbs or subshrubs usually shorter than 3 dm.; upper leaves not white-margined (2)
   2. Annual or perennial herbs but not having a candelilla-like habit (3)
      3. Appendages fewer than 5 per gland, usually solitary or paired (4)
         4. Annual herbs from taproots, usually with a single stem at ground-level (5)
            5 Glands 1, 2, 3, 4 or 5 per involucre, not 2-lobed; appendages solitary per gland; seeds not transversely 4–5-sulcate (6)
               6. Fruit 2.5–3.4 mm. long; seed 2.0–2.9 mm. long; with tubercles and/or ridges; leaves mostly or wholly opposite (7)
                  7. Petioles of larger leaves much shorter than the blades; seeds 2.2–2.9 mm. long; glands 4 or 5 (8)
                     8. Seed with 2 broad tuberculate transverse ridges and slight widening at narrow apical end; leaves serrulate. 16. *E. exstipulata* Engelm.
                     8. Seed not transversely ridged; leaves entire. ..... 24. *E. Henricksonii* M. C. Johnst.
                  7. Petioles about as long as the blades of the longer leaves, about half as long as the blades on the shorter leaves; seed 2.0–2.1 mm. long; glands 1–2 (rarely 3) per involucre. ..... 21. *E. bifurcata* Engelm.
               6. Fruit ca. 2 mm. long; seed ca. 1.5 mm. long, coarsely pitted and with areticulum of tubercles outlining the pits; leaves mostly alternate. ..... 19. *E. graminea* Jacq.
            5. Glands 5, 2-lobed, each lobe with a separate appendage; seeds with 4–5 strong transverse sulci on each facet ..... 20. *E. bilobata* Engelm.

4. Perennial herbs from thickened underground organs, usually with more than 1 stem at ground level (9)
9. Fruit 2.5–3.0 mm. long, seed 2.0–2.5 mm. long; leaves 2–12 (–16) mm. wide, usually not linear ..... 18. *E. biformis* Watson
9. Fruit 3.7–4.2 mm. long, seed 2.8–3.0 mm. long; leaves 1.5–3.5 mm. wide, linear to linear-filiform ..... 22. *E. Wrightii* Torrey & Gray

3. Appendages 5 to 7 per gland, straplike, curved upward and inward over the gland, hiding it. ..... 17. *E. eriantha* Bentham

2. Strongly perennial caespitose plants with numerous essentially leafless glaucous fleshy branches 2–5 (–10) dm. long, 2–4 mm. thick rising erect from the woody horizontal stem. ..... 23. *E. antisyphilitica* Zuccarini

1. Robust annual herbs 3–10 dm. tall; uppermost leaves (near the flowers) with thin, white margins. ..... 25. *E. marginata* Pursh

KEY 5. Species of Euphorbia subgenus Chamaesyce Rafinesque

1. Styles 3, bifid, or if entire then not abruptly round-capitate; plants various in habit and pubescence (2)
2. Appendages entire, lacerate, undulate or crenulate but not parted more than half the radial length, OR appendages absent (3)
3. Appendages subequal or absent; styles various but never entire and filiform (4)
4. Stipules not coalescent or if so then only on one side of the stem or the entire structure deeply lobed or dissected; plants rarely rooted at the lower nodes (5)
5. Plants essentially glabrous including the herbage, inflorescence, ovaries and fruit (ignore stipules and interior of involucre (6)
6. Leaves not linear or if very narrow then serrulate or less than 6 times as long as broad; plants various (7)
7. Fruit shorter than 4.5 mm. (8)
8. Fruit shorter than 2.5 mm. (9)
9. Leaf-blades mostly serrate or serrulate as seen under a lens (10)
10. Seeds 1–2 mm. long; transverse ridges absent (11)
11. Fruit not deeply lobed (12)
12. Styles bifid or if nearly entire then style longer than 0.3 mm. and seed longer than 1.1 mm. (13)
13. Robust to delicate ascending to prostrate herbs; leaf-blades 3–12 (–17) mm. long; seeds smooth (14)
14. Seeds plumply triangular, 1.4–1.5 (–2) mm. long; fruit 1.9–2.2 (–2.6) mm. long ..... 58. *E. serrula* Engelm.
14. Seeds slenderly triangular or quadrangular, 1.0–1.4 mm. long; fruit 1.5–1.9 mm. long. ..... 37. *E. serpyllifolia* Pers.

13. Robust ascending herbs; leaf-blades 8–35 mm. long; seeds finely and irregularly wrinkled or rippled. ..... 34. *E. nutans* Lag.
12. Styles entire, 0.2–0.3 mm. long; seeds 0.9–1.1 mm. long. ..... 62. *E. stictospora* var. *sublaevis* M. C. Johnst.

11. Fruit deeply 3-lobed, the lobes, radially, at least half as long as the total radius. ..... 57. *E. villifera* var. *nuda* Boiss.

10. Seeds 1.0–1.4 mm. long, with a few continuous transverse ridges (either low- or high-relief) as the only sculpturing (15)

15. Plants mostly ascending; staminate flowers (4–) 5–16 (16)

16. Delicate ascending plants, the upper internodes 0.2–0.5 mm. thick; transverse ridges sharp; seeds orange to dark pink. ..... 32. *E. cumbrae* Boiss.

16. More robust, the upper internodes more than 0.5 mm. thick; transverse ridges low, rounded, seeds pale brownish. ..... 33. *E. hyssopifolia* L.

15. Plants mostly prostrate; staminate flowers 1–5. ..... 38. *E. glyptosperma* Engelm.

9. Leaf-blades entire (use lens!) (17)

17. Seeds smooth or wrinkled but not having sharp, continuous transverse ridges (18)

18. Fruit 1.8–2.3 mm. long (19)

19. Seed plump and noticeably laterally compressed with greater radial than tangential dimension. ..... 29. *E. Geyeri* Engelm.

19. Seeds rather similar in tangential and radial dimensions (20)

20. Plants perennial (21)

21. Staminate flowers 30–35; plants strongly suffruticose. ..... 47. *E fruticulosa* Boiss.

21. Staminate flowers 8–20; perennial herbs (22)

22. Appendages as long as broad or longer; leaf-blades 2–5 times as long as broad. 46. *E.chaetocalyx* (Boiss.) Tidestr.

22. Appendages absent or minute; leaf-blades as long as broad or or nearly so. ---- 45. *E. Fendleri* Torrey & Gray
20. Plants annual with slender taproots. ---- 41. *E. Golondrina* Wheeler
18. Fruit 1.2–1.7 mm. long (23)
23. Staminate flowers 2–5; seeds 0.8–1.1 mm. long, fruit 1.2–1.4 mm. long. ---- 43. *E. micromera* Engelm.
23. Staminate flowers 15–32; seeds 1.1–1.3 mm. long; fruit 1.5–1.7 mm. long. ---- 42. *E. simulans* (Wheeler) Warnock & M. C. Johnst.
17. Seeds with several sharp, continuous transverse ridges that may or may not involve the angles (24)
24. Leaf-blades less than 3 times as long as broad; habit various (25)
25. Annual herbs with stems not remarkably glutinous; fruit 1.1–1.6 mm. long; seed 1.0–1.2 mm. long. ---- 39. *E. theriaca* Wheeler
25. Perennial herbs with remarkably glutinous stems; fruit 1.5–2.0 mm. long; seed 1.3–1.5 mm. long. ---- 40. *E. crepitata* Wheeler
24. Leaf-blades ca. 3 times as long as broad; delicate erect annuals. ---- 32. *E. cumbrae* Boiss.
8. Fruit (2.5–) 3.0–3.3 mm. long ---- *E. perennans* (Shinners) Warnock & M. C. Johnst.
7. Fruit (4.5–) 5–6 mm. long. ---- 28. *E. carunculata* Waterfall
6. Leaves linear, blades more than 6 times as long as broad, the margins entire; plants annual (26)
26. Fruit 1.3–1.7 mm. long; delicate, erect annuals, stems mostly less than 1 mm. thick and the plants less than 2 dm. tall; seeds with 1–3 transverse ridges. ---- 31. *E. revoluta* Engelm.
26. Fruit ca. 2 mm. long; plants more robust but sprawling; seeds without transverse ridges. ---- 30. *E. Parryi* Engelm.
5. Plants with some pubescence on herbage or inflorescence or both (27)
27. Ovary and fruit glabrous (28)
28. Fruit unlobed or if lobed then the lobes less than half as long as the total radius, nearly trigonous (29)
29. Leaf-blades serrulate; staminate flowers 1–18; seed 1.0–1.6 (–2.0) mm. long, smooth or wrinkled (30)

30. Seeds 1.0–1.4 mm. long with a few continuous transverse ridges (either low- or high-relief) as the only sculpturing (31)
    31. Plants mostly ascending; staminate flowers (4–) 5–16. (32)
        32. Delicate, ascending plants, the upper internodes 0.2–0.5 mm. thick; transverse ridges sharp; seeds orange to dark pink. ..... 32. *E. cumbrae* Boiss.
        32. More robust, the upper internodes more than 0.5 mm. thick; transverse ridges low, rounded; seed pale brownish. ..... 33. *E. hyssopifolia* L.
    31. Plants mostly prostrate; staminate flowers 1–5. ..... 38. *E. glyptosperma* Engelm.
30. Seeds 1–2 mm. long; transverse ridges absent (33)
    33. Non-robust to delicate ascending or prostrate herbs; leaf-blades 3–12 (–17) mm. long; seeds smooth (34)
        34. Seeds plump, triangular in transection, 1.4–1.5 (–2) mm. long; fruit 1.9–2.2 (–2.6) mm. long. ..... 58. *E. serrula* Engelm.
        34. Seeds slender, triangular or quadrangular in transection, 1.0–1.4 mm. long; fruit 1.5–1.9 mm. long. ..... 37. *E. serpyllifolia* Pers.
    33. Robust ascending herbs; leaf-blades 8–35 mm. long; seeds finely and irregularly wrinkled or ribbed. ..... 34. *E. nutans* Lag.
29. Leaf-blades entire (use lens!); staminate flowers 2–5; seed 0.8–1.1 mm. long, nearly smooth ..... 43. *E. micromera* Engelm.
28. Fruit deeply 3-lobed, the lobes radially at least half as long as the total radius. ..... 57. *E. villifera* Scheele
27. Ovary and fruit pubescent (35)
    35. Inflorescence not capitate or terminal, the involucres few at the forks or distal nodes or in leafy lateral brachyblasts (36)
        36. Leaf-blades entire (use lens!); plants perennial or rarely annual (37)
            37. Fruit 1.2–2.6 mm. long; leaf-tip not spinulose (38)
                38. Seeds longer than 1.2 mm. or if about 1.2 mm. long then the seeds smooth or the hairs usually crisped or staminate flowers more than 15; plants strongly perennial (39)
                    39. Seeds essentially smooth; foliage not strongly dimorphic (40)
                        40. Herbage-pubescence of stiffly spreading hairs scarcely at all crisped, 0.5–0.2 mm.

long; appendages essentially absent (41)
41. Pubescence sparse, hairs 0.05–0.1 mm. long. ..... 47. *E. fruticulosa* var. *hirtella* *M. C.* Johnst.
41. Pubescence dense, hairs 0.1–0.2 mm. long. ..... 48. *E. scopulorum* var. *inornata* M. C. Johnst.

40. Herbage-pubescence of appressed or subappressed often crisped or curled hairs 0.1–0.3 mm. long (42)
42. Seeds 1.0–1.3 (–1.5) mm. long; fruit 1.2–1.5 (–1.75) mm. long; leaf-blades flat. ..... 50. *E. cinerascens* Engelm.
42. Seeds 1.5–1.8 (–2.0) mm. long; fruit 1.9–2.3 mm. long; leaf-blades often revolute. 49. *E. lata* Engelm.

39. Seeds with a few, low, irregularly anastomosing transverse ridges; leaves often dimorphic, the lower leaves proportionately narrower and longer than the upper. ..... 27. *E. angusta* Engelm.

38. Seeds 1.0–1.2 mm. long with some rounded, irregularly anastomosing transverse grooves; staminate flowers 5–15; herbage with spreading straight clavellate hairs almost 1 mm. long; plants annual or usually weakly perennial. ..... 56. *E. arizonica* Engelm.

37. Fruit 2.8–3.1 mm. long; leaf-blades rather rigid and produced at apex into a sharp, spinulose point. ..... 26. *E. acuta* Engelm.

36. Leaf-blades serrulate; plants annual or less commonly perennial (43)
43. Styles bifid (44)
44. Hairs much less than 1.0 mm. long, usually crisped and not straight; seeds ca. 1.0 mm. long (45)
45. Seeds with low, subregular transverse ridges not whitened at summit. ..... 60. *E. maculata* L.
45. Seeds with low, sharp, transverse ridges, the summits of which are whitened. ..... 61. *E. prostrata* Ait.
44. Herbage with spreading straightish hairs ca. 1 mm. long; seeds 1.2–1.4 mm. long. ..... 63. *E. velleriflora* (Kl. & Gke.) Boiss.
43. Styles entire or nearly so. ..... 62. *E. stictospora* Engelm.

35. Inflorescence capitate, terminal, crowded (through suppression of internodes) (46)
46. Annual herbs; staminate flowers 4–8. ..... 35. *E. lasiocarpa* Kl.
46. Perennial herbs; staminate flowers 10–35. ..... 36. *E. capitellata* Engelm.

4. On both sides of the stem the 2 stipules at each node coalescent into a white or reddish white membranous glabrous scale that may be either entire or lacerate; plants commonly rooted at the lower nodes (47)
47. Perennials; staminate flowers more than 12. ..... 53. *E. albomarginata* T. & G.
47. Annuals; staminate flowers fewer than 12. ..... 54. *E. serpens* H.B.K.

3. Appendages markedly unequal on each involucre, 2 adjacent ones at least twice (usually 3 to 5 times) as long as the other 2; styles entire and filiform. ..... 59. *E. indivisa* (Engelm.) Tidestr.

2. Appendages deeply parted, lobed or dissected at least half the radial length or appendages several per gland, narrow (48)
48. Plants strongly perennial or even suffruticose (49)
49. Plants glabrous; leaf-blades 3–6 times as long as broad; glands 0.3–0.4 mm. tangentially. ..... 46. *E. chaetocalyx* var. *triligulata* (Wheeler) M. C. Johnst.
49. Plants pubescent (one exceptional collection glabrous!); blades ca. twice as long as broad or less; glands 0.5–0.9 mm. tangentially. ..... 48. *E. scopulorum* Brandeg., varieties
48. Plants short-lived, probably annual; herbage and fruit with long white, spreading hairs ..... 55. *E. setiloba* Torr.

1. Styles 3, ca. 0.5 mm. long, abruptly and thickly round-capitate, not bifid; low perennials, all glabrous; stipules coalescent into short scales (50)
50. Appendages deeply dissected and lobed. ..... 51. *E. jejuna* M. C. Johnst. & Warnock
50. Appendages narrow, entire. ..... 52. *E. astyla* Engelm.

The most recent defendant of generic segregation of *Chamaesyce* S. F. Gray from Euphorbia L. (Webster, 1967), following, as he says, the footsteps of Millspaugh, Small, Croizat, Shinners, Dressler and Burch, says (1) *Chamaesyce* is "very natural, if rather weakly defined," (2) a few species "seem to stand on the boundary line" between *Chamaesyce* and *Euphorbia* subgenus *Agaloma*, and (3) recognition of *Chamaesyce* as a genus is "expedient" because it "includes a large number of widespread species recognizable by a characteristic habit." Furthermore, according to Webster,

> the arguments for retaining *Chamaesyce* at subgeneric rank boil down to two: a distaste for cutting up *Euphorbia* into a number of smaller genera . . . and the difficulty in defining the segregate genus exactly. The first argument, which *merely* indicates the role of inertia in taxonomic practice, *may be dismissed on operational grounds* [emphasis supplied] . . . the difficulty in writing an unequivocal generic diagnosis of *Chamaesyce* is real, but not greater in actuality than for many other euphorbiaceous genera.

Perhaps it is justifiable to paraphrase the above and state in rebuttal that the arguments for recognition of a genus *Chamaesyce* boil down to two: a taste for cutting up a large genus into smaller genera, and the fact that it is possible to define the segregates as sharply as a number of other

weak genera have been defined by us bee-busy taxonomists. The dismissal of "inertia in taxonomic practice" is justified only if compelling evidence is presented for change; none has been forthcoming. While the probability remains that some taxonomists will continue to recognize *Chamaesyce* at the generic level, I must conclude that this recognition remains unnecessary. Furthermore, inasmuch as most lay and professional botanists still use an inclusive concept of *Euphorbia*, the recognition of *Chamaesyce* as a genus is a latent if not actual impediment to communication, and is therefore inadvisable. The use of a broad concept of *Euphorbia* reaffirms an appreciation of the often benign role of inertia in scientific communication.

Euphorbia theriaca Wheeler var. **spurca** M. C. Johnst., var. nov. — A varietate typica glandium appendiculibus semilunatis vel subligaculiformibus radialiter 0.05–0.3 mm. longis differt.

Texas, Hudspeth Co., in gravelly wash along Rio Grande 16 km. northwest of Indian Hot Springs, July 5, 1958, *D. S. Correll and I. M. Johnston 19285* (LL, holotype); Presidio Co., 74 km. south-southwest of Marfa on highway No. 67 to Presidio, *J. D. Bacon and R. L. Hartman 1424* (LL); Solitario mountains, 29°32′ N. lat., 103°51′ W. long., 1,350 m., Oct. 18, 1958, *M. C. Johnston 3534* (TEX); ca. 16 km. south of Presidio, Sep. 11, 1961, *D. S. Correll and M. C. Johnston 24421* (LL); 16 km. northeast of Presidio on road to Shafter, July 31, 1945, *C. H. Muller 8457* (LL); Brewster Co., sand at mouth of Terlingua Creek, Big Bend National Park, July 22, 1957, *D. S. Correll and I. M. Johnston 18348* (LL).

Mexico: Coahuila, Bolson de los Lipanes, between El Almagre and Cerros de Leja [= Leija], 27°38′ N. lat., Sep. 12, 1940, *I. M. Johnston and C. H. Muller 1236* (LL); between Sierra de Hechiceros and Sierra de Altares, 3.5 km. north of Rancho Alamo de Marques and only a couple of km. from Chihuahua state line, 28°45′30″ N. lat., 103°27′ W. long., 925 m., Oct. 2, 1972, *M. C. Johnston, T. L. Wendt and F. Chiang 9653* (LL); 51 km. south of Boquillas on the Muzquiz highway, east of Cerro Tecoscana, 28°47′40″ N. lat., 102°43′ W. long., 1,100 m., Sep. 14, 1972, *Johnston, et al. 9233* (LL). Chihuahua, 14 km. east of Alamo Chapo Viejo on the road to Manuel Benavides, 28°14′30″ N. lat., 104°14′ W. long., 1,050 m., Oct. 4, 1972, *Johnston, et al. 9694* (LL); 6 km. north of Rancho El Bosque just above Canon de Santa Elena of Rio Grande, 29°11′ N. lat., 103°43′ W. long., 725 m., Oct. 3, 1972, *Johnston et al. 9687* (LL); 13.5 km. by winding road west of Guadalupe Victoria on road to Rancho Santa Maria de Guadalupe, 31°36′ N. lat., 107°50′ W. long., 1,250 m., Aug. 18, 1972, *Johnston, et al. 8681c* (LL); western margin of Laguna de Palomas, 31°42′30″ N. lat., 107°35′ W. long., 1,230 m., Aug. 18, 1972, *Johnston et al. 8670* (LL); 8 km. southeast of San Carlos, 28°58′ N. lat., 103°40′ W. long., Aug. 10, 1940, *I. M. Johnston and C. H. Muller 94* (LL).

The presence and absence of minute appendages are character-states normally encountered within single populations of species of the subgenus *Chamaesyce*. Therefore, normally, such character-states are negligible taxonomically. In this case, however, there is significant geographical segregation of the two forms, and varietal status is justified. In general,

the var. *spurca* occupies the western and northwestern two-thirds of the distributional area of the species, whereas var. *theriaca* is confined to the southwestern third, with some exceptional localities, however.

The chromosomes in pollen mother cells of the var. *spurca* have been counted by L. E. Urbatsch and R. E. Hartman (personal communication) as $n = 14$ pairs, the voucher specimen being *Bacon and Hartman 1424*, cited above. The variety *theriaca* is still unknown cytologically.

Euphorbia crepitata Wheeler var. **longa** M. C. Johnst., var. nov. – A varietate typica plantis ca. 43 cm. altis, laminis foliorum lanceo-ovatis vel anguste ovatis 3.0–8.5 mm. longis, 1.5–4.0 mm. latis apice angulis 60–90° base cuneatis vel saepe rotundatis, glandulis involucrorum tangentialiter 0.7–1.2 mm. longis, appendiculibus radialiter 0.4–0.5 mm. longis, floribus staminatis 24–38, stylis 0.5–0.7 mm. longis differt.

Mexico: Coahuila, 50 km. northeast of San Pedro de las Colonias, foothills and plains west of Cerro Masamtote near Puerto de Ventanillas, ca. 3 km. east of highway to Cuatro Cienegas, 26°00′ N. lat., 102°44′ W. long., 1,240 m., on gypsum soil with *Agave lecheguilla, Petalonyx, Acacia, Coldenia, Grusonia, Fouquieria Shrevei*, etc., Aug. 17, 1973, *J. Hendrickson 12502* (TEX., holotype; isotypes to be distributed).

Euphorbia Fendleri Torrey et Gray – The nomenclatural change following removes the varieties previously referred to this species. In this restricted sense, *E. Fendleri* has not yet been collected in Mexico, though some of its stations in western Texas are within a kilometer or two of the Rio Grande.

Euphorbia chaetocalyx (Boiss.) Tidestr. var. **triligu'ata** (Wheeler) M. C. Johnst., comb. nov. – Based on *E. Fendleri* var. *triligulata* Wheeler, Bull. Torrey Bot. Club 63: 445. 1936.

Euphorbia fruticulosa Boissier – Suffrutices glabri 9–20 (–30) cm. alti; caudices erecti parce ramosi fuliginosi 3–5 (–15) mm. crassi; caules lignosi parce ramosi 2–3 (–4.5) mm. crassi cortice fumea tenui squamulosa; rami hornotini pauci numerosive pro maxima parte pseudodichotomi internodiis (2–) (3–8) (–20) mm. longis 0.3–0.6 (–1.2) mm. crassis badiis demum cinerei-nubilatis; laminae foliorum ovato-deltoideae 4–8 (–12) mm. longae 2–3 (–9) mm. latae basi rotundatae vel asymmetrice cordatae apice saepe acutae angulo (45–) 60–90° vel raro rotundatae integrae olivaceae saepe cinerei-nubilatae vel glauci-nubilatae firmae in sicco microrugulosae; petioli 0.5–1 (–2) mm. longi dorsiventraliter compressi rosei vel brunnei; stipulae liberae vel dorsaliter coalescentes subulatae 0.4–0.8 mm. longae roseae minute ciliatae pilis translucentibus; pedunculi 1–5 mm. longi; cyathia 1.3–2 mm. longa anguste turbinata vel urceolati-sphaerica rosei-olivacea vel brunnei-purpurea in sicco rugulosi-papillata inter nervos; glandes 4 fere sessiles fere orbiculares tangentialiter 0.4–1 mm. longae radialiter 0.3–0.8 mm. longae in sicco paululum cupulatae olivaceae vel atropurpureae; appendices admodum nullae; flores staminati 30–35 ad maturitatem involucrum 0.2–1 mm. superantes; antherae roseae vel atropurpureae vel albi filamentis albidis; pollen flavum;

flos pistillatus per anthesin vix exsertus; styli 3, 0.3–0.6 mm. longi, effusi purpurei prope medium bifurcati, lobi lineari-sublanceolati pallidi crassitie styli-baseos; capsulae pedunculus demum involucrum 1–2.5 mm. superans; capsula 2–2.3 mm. longa transectione rotundate deltoidea; columella 1.8–1.9 mm. longa; semen 1.5–2 mm. longum dimensione radialiter 0.8–0.9 mm. tangentialiter 0.8–0.9 mm., albidi-cinereum in sicco laeve in madefacto villis effusis hydophilis angulus dihedralis ventralis 100° dorsalis ca. 80° superficies ventrales paululum depressae dorsales paululum convexae vel concavae nonrugulosae; chromosomatum numerus $n = 13$.

Mexico: Coahuila, Valle del Sobaco, southwestern flank of Sierra del Venado, Canon Escondido, a broad desert canyon in gypseous limestone, 26°27′ N. lat., 102°42′ W. long., 925 m., Sep. 23, 1972, *M. C. Johnston, F. Chiang and T. L. Wendt 9472* (TEX); Valle del Sobaco ca. 44 mi. northeast of San Pedro de las Colonias, 6 mi. northeast of Las Delicias along Coahuila highway No. 30, pure gypsum, 26°14′ N. lat., 102°41′ W. long., 2980 ft. Aug. 24, 1971, *J. Henrickson 6018* (TEX); Valle del Sobaco, south end of Sierra del Venado, 26°22′ N. lat., 102°40′ W. long., 840 m., gypseous hills, March 22, 1973, *Johnston, et al. 13044* (TEX); Valle del Sobaco, extreme southwestern end of Puerto del Venado, extreme southern end of Sierra del Venado, 26°21′ N. lat., 102°40′ W. long., 850 m., gypseous desert flat, Sep. 22, 1972, *Johnston, et al. 9460* (TEX); ca. 62 air mi. southwest of Cuatro Cienegas, 10 road mi. northeast of turnoff to Las Delicias on San Pedro-Cuatro Cienegas highway, 26°19′ N. lat., 102°39′ W. long., gypsum knolls, 2,800 ft., Aug. 18, 1973, *J. Henrickson 12529* (TEX); Valle del Sobaco, 9 km. south of Restaurante El Mezquite on Cuatro Cienegas-San Pedro highway, 26°18′ N. lat., 102°40′ W. long., 800 m. gypseous area, June 14, 1972, *Johnston, et al. 7789* (TEX); 68 road miles southwest of Cuatro Cienegas on highway to Torreon, 26°35′ N. lat., 102°21′ long., 840 m., gypseous bajada, March 22, 1973, *Johnston, et al. 10340b* (TEX); Cuatro Cienegas basin, ca. 7 mi. south-southwest of Cuatro Cienegas, gypsum mounds, May 20, 1972, *L. E. Urbatsch 1016* (TEX); gypsum dunes ca. 12 mi. southwest of Cuatro Cienegas, May 20, 1972, *L. E. Urbatsch 1017* (TEX; cytological voucher for chromosome number reported above); 9–12 mi. south-southwest of Cuatro Cienegas, Sierra de San Marcos, Aug. 12, 1967, *D. J. Pinkava 3713* (ASU); northern point of Sierra de San Marcos south-southwest of Cuatro Cienegas, July 10, 1968, *J. Lewis s.n.* (ASU); dunes west of Laguna Grande southwest of Cuatro Cienegas, Aug. 13, 1967, *Pinkava 3814* (ASU); dunes southwest of Laguna Grande, July 9, 1974, *R. Engard and M. Getz 291* (ASU); ca. 12 air miles southwest of Cuatro Cienegas, 13.5 mi. on highway to San Pedro and 4.4 mi. west on trail, 26°53′ N. lat., 102°12′ W. long., 2600 ft., Aug. 18, 1973, *J. Henrickson 12548* (TEX); southern part of Sierra de los Organos, 26°47′ N. lat., 103°03′ W. long., 1200 m., Aug. 8, 1973, *Johnston, et al. 12140b* (TEX). Nuevo Leon, 12 km. east of Rancho La Escondida, just north of Rancho La Laguna, 26°13′ N. lat., 101°01′ W. long., 825 m., sandy alluvium, March 17, 1973, *Johnston, et al. 10261* (TEX); Canon de Potrerillos, 3 km. west of Rancho Las Ovejas on the northern side of Sierra del Muerto, 26°01′30″ N. lat., 100°42′ W. long., 775 m., March 16, 1973, *Johnston, et al. 10241q* (TEX); 3 km. from El

Milagro and 10 km. from Icamole on the winding road between them, 25°55′30″ N. lat., 100°47′ W. long., 720 m., subsaline flat with much gypsum, July 5, 1973, *Johnston, et al. 11615* (TEX); 7 km. west of Icamole toward El Milagro, shaly mineralized soil, 25°56′30″ N. lat., 100°45′ W. long., 690 m., July 5, 1973, *Johnston, et al. 11606a* (TEX). Durango, 2 mi. southwest of Nazas, slopes above canyon, 25°09′ N. lat., 103°44′ W. long., 4900 ft., *J. Henrickson and T. L. Wendt 12329* (TEX).

Euphorbia fruticulosa is a strong but apparently not an obligate desert gypsophile found at elevations from 700 to 1000 m. (or 1500 m. at the single Durango station). Its substrates range from hard gypseous limestone ledges to packed but porous pure gypsum dune-sands to anhydrite outcrops. Occasionally, it appears in sandy alluvium or "reddish sand" (Durango collection) or nearly pure limestone without evidence of gypsum or other soluble materials. Its vegetational associates run the gamut of the various dominant species in the central part of the Chihuahuan Desert Region.

Euphorbia fruticulosa is mostly related to *E. chactocalyx* var *triligulata* and to only a slightly lesser degree to *E. chaetocalyx* var. *chaetocalyx*. All these taxa are related to *E. Fendleri*. It is highly possible that *E. scopulorum* is also among the fairly close relatives. In addition to the morphological distinctions between these taxa given in the key, cytological information may be helpful in distinguishing between them. For example, *E. Fendleri* has $n = 14$ pairs, *E. chaetocalyx* var. *chaetocalyx* $n = 26$ pairs, but *E. scopulorum* and *E. fruticulosa* both $n = 13$ pairs. *E. chactocalyx* var. *triligulata* is still unknown cytologically. The cytological data are from Urbatsch, et al. (1975), except for the report for *E. scopulorum* which is based on unpublished work by Dr. Lowell E. Urbatsch, to whom I am indebted for this information; the voucher for the *E. scopulorum* count is Coahuila, ca. 7 mi. from Cuatro Cienegas near railroad and just west of mountain pass on road to Laguna del Rey, May 21, 1972, *A. M. Powell and B. L. Turner 2290* (TEX).

Euphorbia fruticulosa var. **hirtella** M. C. Johnst., var. nov. — A varietate typica foliis ramisque fructibusque pubescentibus pilis effusis translucentibus 0.05–0.1 mm. longis differt.

Mexico: Coahuila, 4 km. by winding road east of El Coyote at northwestern end of Sierra de Solis, 25°40′ N. lat., 103°10′ W. long., ca. 1,100 m., on a large, almost pure gypsum outcrop, Aug. 16, 1974, *R. Spellenberg and J. Syvertsen 3769* (TEX, holotype, apparently a unicate).

Dr. Spellenberg (personal communication), to whom I am indebted for the specimen, reports the following gypsum-tolerant taxa at the same place: *Fouquieria Shrevei* I. M. Johnst., *Larrea tridentata* (DC.) Cov., *Euphorbia antisyphilitica* Zucc., *Selinocarpus Palmeri* Hemsl., and species of *Echinocereus*, *Ferocactus*, *Opuntia*, and *Jatropha*. The type and only known locality for this variety is apparently the same as or very near to the one called San Lorenzo de la Laguna by Edward Palmer, who collected there May 1–10, 1880 (McVaugh, 1956). *Selinocarpus Palmeri* is known only from Palmer's collection from "San Lorenzo" and Spellenberg's 1974 collection made at this locality. There is a modern "San Lo-

renzo" nearby at 25°43′ N. lat., 103°09′ W. long. Dr. Spellenberg was specifically attempting to relocate the Palmer locality and to recollect *Selinocarpus Palmeri;* apparently he was successful.

Euphorbia scopulorum Brandegee var. **inornata** M. C. Johnst., var. nov. — A varietate typica glandium appendicibus nullis vel quasi nullis differt.

Mexico: Coahuila, Americanos, 27°10′ N. lat., 103°17′ W. long., common on gypsum beds, prostrate, Sep. 23, 1941, *I. M. Johnston 9382* (LL, holotype); west of Buenavista, 27°35′ N. lat., 103°12′ W. long., frequent on bank of gypsiferous shales, prostrate, Aug. 21, 1941, *I. M. Johnston 8305* (LL); Puertecito, 27°17′ N. lat., 102°52′ W. long., gypseous bank just east of ranch, prostrate, Aug. 28, 1941, *I. M. Johnston 8586* (LL); Tanque del Cuervo Grande east of Tanque Jerico, 27°23′ N. lat., 102°39′ W. long., on rather bare silty plain, common, prostrate, no date, *I. M. Johnston 8349* (LL); just south of Matrimonio Viejo, 27°07′ N. lat., 103°07′ W. long., gypsiferous shales, prostrate, Sep. 22, 1941, *I. M. Johnston 9361* (LL); south of Laguna de Leche, 27°10′ N. lat., 102°55′ W. long., gypseous soil, planed-off upper Cretaceous bed, on flat, prostrate, Aug. 30, 1941, *I. M. Johnston 8617* (LL).

The distribution of this variety is compact and lies wholly northwest of that of *E. scopulorum* var. *scopulorum*, with no overlap.

Euphorbia scopulorum var. **nuda** M. C. Johnst., var. nov. — A varietate typica caulibus foliisque (praeter stipulas) inflorescentiisque fructibusque glabris differt.

Mexico: Coahuila, in heavy clay on open plain at base of mountains, 45 mi. north of Saltillo, route "#75", May 1, 1959, *D. S. Correll and I. M. Johnston 21314* (LL, holotype); though not clearly stated on the label, the locality is apparently on the highway presently No. 57 (not "75") from Saltillo north to Piedras Negras, and is near 25°55′ N. lat., 101°13′ W. long., about 140 km. southeast of the nearest locality for the typical variety.

Euphorbia stictospora Engelm. var. **sublaevis** M. C. Johnst., var nov. — A varietate typica partibus omnibus parvis, ramis fere glabris, foliis glabris vel fere glabris seminibus 0.9–1.1 mm. longis laevibus differt.

Mexico: San Luis Potosi, 3 km. northwest of Matehuala on road to Cedral in open gypsum flats, 23°42′ N. lat., 100°39′ W. long., Sep. 11, 1971, *J. Henrickson 6638* (LL, holotype); 61 km. south of Matehuala, 23°10′ N. lat., 100°30′ W. long., gypsum flats, Sept. 10, 1938, *I. M. Johnsson 7511* (US); near Km. 549, 58 km. south Matehuala, alkaline soil desert in flats near area of solution sinks, 1,250 m., occasional, Sep. 27, 1958, *R. McVaugh 18213* (MICH); Estacion de Catorce, gravelly bed of arroyo, 23°41′ N. lat., 100°59′ W. long., 1,900 m., Jul. 24, 1934, *F. W. Pennell 17562* (MICH, US); 10.5 km. by road south of Arista, 22°34′ N lat., 100°52′ W. long., 1,500 m., limestone hills, Sep. 6, 1971, *J. Henrickson 6435* (LL). Nuevo Leon, 45 km. north of San Roberto near Km. 162 on the highway to Saltillo, 25°00′ N. lat., 100°32′ W. long., white gypseous soil, Sep. 5, 1971, *J. D. Bacon, W. R. Leverich and B. L. Turner 1107*

(TEX); along highway No. 60, 11 km. west of Iturbide, prostrate on level barren areas, locally common, 1,750 m., Jul. 5, 1963, *R. L. McGregor, et al. 38* (MICH).

Some indications that this taxon may actually be specifically distinct from *E. stictospora* var. *stictospora* include the facts that it is not well distinguished from the latter geographically, and that at one locality both varieties were apparently found growing near each other with no indication of intergradation (*McGregor, et al. 38* is var. *sublaevis, 39* is var. *stictospora*). On the other hand, the extreme similarity of the two varieties dictates the present treatment of them as conspecific.

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REYNOSIA BARBATULA (RHAMNACEAE), NEW SPECIES FROM GUATEMALA

MARSHALL C. JOHNSTON[1]

AND

CYRUS LONGWORTH LUNDELL[2]

Reynosia barbatula M. C. Johnst. & Lundell, sp. nov. — Frutex ca. 6 m. altus vel saepe arbor 10–20 m. alta inermis pro parte maxima glabra, sed rami hornotini ad nodos minute hispiduli; folia opposita; laminae elliptica vel ovato-elliptica, (5–) 8–12 (–14) cm. longae, (2.5–) 3–4 (–5) cm. latae integrae planae basi cuneatae vel rotundatae apice late apiculatae vel breve acuminatae acumine ca. 1 cm. longo, supra glabrae costa impressa, subtus costa prominulenti pro maxima parte glabrae sed in axillis nervi secundarii barbatulae pilis albidis ca. 0.2 mm. longis, nervi secundarii in quoque latere costae ca. 8 eucamptodromi, nervi tertiarii eleganter horizontaliter percurrentes; petioli 9–15 mm. longi ventraliter sulcati pubescentes; stipulae subulatae 1–2 mm. longae hispidulae caducae; inflorescentiae (e *Contreras 6733*) sessiles axillares 1–3-florae; pedicelli per anthesin 2–3 mm. longi demum 5–8 mm. longi; flores (e *Contreras 6733*) hermaphroditi regulares 5-meri flavovirides; cupula floralis 1.5 mm. longa; sepala deltoidea ca. 1.5 mm. longa; petala ca. 1 mm. longa, distincte emarginata; ovarium subglobosum biloculare; styli 2 divaricati persistentes 0.5 mm. longi basi connati ventraliter plani rugulosi; drupae solitariae in quoque axilla, subglobosae vel modice prolatae ad 2 cm. longae (e *Contreras 9019*) atropurpureae; putamina prolata; semen solitarium; endospermium profunde ruminatum copiosum; radicula minuta cotyledonibus 6-plo brevior.

Guatemala: Dept. Peten, Pusila, 5 km. from La Cumbre, 2 km. south from the village, in high forest bordering Pusila River, Aug. 25, 1969, *Elias Contreras 9019* (LL, type), tree, 60 ft. high, 15 in. diam., fruit black; Cadenas, km. 4, Morales Road, in forest, Mar. 13, 1967, *Contreras 6733* (LL), tree, 35 ft. high, 6 in. diam., flowers yellow-green; La Cumbre, east of km. 142 of Cadenas Road, on hill, Mar. 13, 1967, *Contreras 6896* (LL), tree, 25 ft. high, 3 in. diam.; Cadenas, in forest on top of hill, Mar. 24, 1967, *Contreras 6837* (LL), tree, 50 ft. high; La Cumbre, west of km. 140 of Cadenas Road, in high forest, Jul. 25, 1969, *Contreras 8742* (LL), tree 25 ft. high, 4 in. diam.; La Cumbre, west of km. 143 of Cadenas Road, in low forest on hill, Jul. 30, 1969, *Contreras 8795* (LL), tree, 40 ft. high; Pusila, 5 km. from La Cumbre, bordering Pusila River, in high forest on hill, Aug. 25, 1969, *Contreras 9030* (LL), tree 35 ft. high, 4 in. diam., fruit yellow-green; La Cumbre, in forest on top of rocky hill, May 13, 1967, *Contreras 6893* (LL), shrub 20 ft. high, 4 in. diam. Dept. Izabal, Puerto Mendez, in low forest on hill bordering village, Jun. 8, 1970, *Contreras 9981* (LL), tree 25 ft. high, 3 in. diam.

The genus *Reynosia* Griseb. has heretofore been known from the Virgin Islands west and northwest to Jamaica, Cuba, Florida and the Bahamas. The present report thus extends the genus at least 1,000 km. westward

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and for the first time into Central America. With its arboreal stature, 5-merous flowers, deeply emarginate petals, sessile inflorescences and large leaves, *R. barbatula* is most similar to *R. regia* Urban & Ekman of Haiti. But it is quite distinct from any other species in the greenish petals, elliptic leaves and the unique beards in the axils of the secondary nerves beneath.

STUDIES OF AMERICAN PLANTS – IX

CYRUS LONGWORTH LUNDELL[1]

The avocado, *Persea americana* L., is one of our important fruit trees. Native to Guatemala, Honduras and Chiapas, it has a number of close relatives in this area referable to the subgenus *Persea*. Altogether too little is known about these, and their potential as sources of germ plasm to improve or develop new varieties for cultivation. My interest in such wild species and the progenitors of other New World species of economic importance is well known. The discovery of two new species in the subgenus *Persea* in Guatemala indicates again the need for intensive exploration and the rewards of such exploration.

In addition to the species of *Persea*, a striking new *Sloanea* of the Tiliaceae, and another *Calyptranthes* in an endless series of additions to the Myrtaceae of Middle America, I propose a change in the status of recently described taxa in the Celastraceae and Sapotaceae.

LAURACEAE

Persea paucitriplinervia Lundell, sp. nov. – Arbor, ad 16 m. alta, 25 cm. diam., ramulis crassis, rufo-tomentosis; folia petiolata, petiolo crasso, ad 3.5 mm. diam., 1–4.5 cm. longo, canaliculato; lamina coriacea, supra glabra, subtus tomentosa, ovato-elliptica, elliptica vel elliptico-lanceolata, 9.5–22 cm. longa, 3–9 cm. lata, apice acuta vel acuminata, basi acuta, raro subtriplinervia; infructescentia subterminalis, tomentella, crassa, 3–6 cm. longa; pedicelli fructiferi 3–5 mm. longi; fructus obovoideus, ad 4 cm. longus et latus.

Tree, up to 16 m. tall, 25 cm. diam., the branchlets thick, with leaves crowded at apex, red-tomentose, the apical buds bright-red; leaves with thick petioles up to 3.5 mm. diam., drying blackish, canaliculate, 1–4.5 cm. long, pubescent at first; leaf blades coriaceous, glabrous above at maturity, persistently reddish-brown tomentose beneath with fine short hairs, the pubescense densest and darker along the costa and veins, the blades ovate-elliptic, elliptic or elliptic-lanceolate, 9.5–22 cm. long, 3–9 cm. wide, apex acute or acuminate, base acute, sometimes subabruptly constricted up to 3 cm. above base, and subtriplinerved, the costa and 6–8 pairs of primary nerves prominent beneath, the nerves sharply ascending below, more arcuate above, prominently reticulate, the costa and primary nerves impressed above, the surface finely areolate; infructescence subterminal, stout, 3–6 cm. long, minutely tomentose, with a single fruit with thick pedicel 3–5 mm. long; fruits pyriform or obovoid, up to 4 cm. long and wide, the surface prominently lenticellate, appearing scurfy, with no pubescence evident.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on hill, west of km. 154, on the Coban Road, April 12, 1975, *C. L. Lundell & Elias Contreras 19177* (LL, type), tree, 50 ft. tall, 10 in. diam., fruit green, "*laurel.*"

With fruit mature or nearly so, only fragments of the flowers persist. The reflexed perianth lobes are lanceolate, 3–3.8 mm. long (dry), tomentellous on both surfaces, acutish, the filaments are pubescent. The species

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appears to be related to *P. americana* L., but differing notably in having some leaves constricted above base and subtriplinerved, in its coarser reticulate venation, red-tomentose branchlets, and much smaller flowers. Some leaves of *P. paucitriplinervia* are somewhat glaucous beneath, but most have a reddish hue like the pubescence.

Persea perglauca Lundell, sp. nov. – Arbor, ad 20 m. alta, 20 cm. diam., ramulis novellis minute adpresse puberulis, glabratis; folia alternata, subtus perglauca, petiolata, petiolo 6–16 mm. longo; lamina novella minute sericea, glabrata, anguste elliptica vel oblongo-elliptica, 4.5–13.5 cm. longa, 1.7–4.5 cm. lata, apice acuta vel subacuminata, basi acuta vel obtusiuscula, venis primariis 9–11-jugis, venulis utrinque aerolatis; inflorescentia subterminalis, minute sericea, ca. 2 cm. longa, pauciflora; pedicelli 2–3.5 mm. longi; flores ca. 3 mm. longi; perianthii segmenta elliptica, 2.2–2.6 mm. longa, utrinque minute sericea; staminorum serierum I et II, filamenta glabra, ca. 1 mm. longa, antheris quadrilocularibus, locularibus superioribus vestigialibus; staminorum serierum III, filamenta glabra cum glandulis, antheris oblongis, quadrilocularibus; staminodia sagittata, stipitata, 1 mm. longa; gynoecium hirsutum.

Tree, up to 20 m. tall, 20 cm. diam., the tender branchlets very slender, drying blackish, at first minutely appressed-puberulent, glabrate, the older branchlets stouter, glabrous; leaves alternate, conspicuously glaucous beneath, the tender leaves and leaf buds minutely sericeous, glabrous above very early; mature leaves with canaliculate petioles 6–16 mm. long; leaf blades thin, chartaceous, usually narrowly elliptic or oblong-elliptic, sometimes lanceolate or oblanceolate, 4.5–13 cm. long, 1.7–4.5 cm. wide, apex acute or subacuminate, sometimes only apiculate, base acute or obtusish, the midvein prominent beneath, shallowly impressed above, the primary lateral veins 9–11 pairs, slender, widely ascending, rather obscurely areolate on both surfaces; inflorescence subterminal, very small, up to 2 cm. long, the panicle with a terminal umbel of 4- or 5-flowers, below which are several, usually 2, solitary flowers, the inflorescence and flowers minutely sericeous; peduncles slender, 6–11 mm. long; pedicels 2–3.5 mm. long; flowers about 3 mm. long; outer perianth-segments elliptic, about 2.2 mm. long, 1.4 mm. wide, obtusish, finely appressed pubescent on both surfaces; inner perianth-segments elliptic, about 2.6 mm. long, 1.6 mm. wide, obtusish, finely appressed pubescent on both surfaces, subcucullate at anthesis; stamens 1.5–2 mm. long, the filaments of series I and II glabrous, about 1 mm. long, the anthers ovate, quadrilocular, with apical cells very small, apparently abortive; filaments and stamens of series III glabrous, 1 mm. long, the small glands subsessile, subbasally adnate to filament, the anthers quadrilocular, oblong-ellipsoid; staminodia of series IV stipitate, sagittate, 1 mm. long, acutish; gynoecium pubescent, 2 mm. long, the ovary and style subequal, the stigma peltate; fruits pyriform, 2–3.5 cm. long, with persistent perianth segments at base, the infructescence accrescent, stout.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, east of km. 154, April 16, 1975, *C. L. Lundell & Elias Contreras 19217* (LL, type, flowers), tree, 60 ft. tall, 8 in. diam., flowers yellow-green, *"laurel"*; same locality, *Lundell & Contreras 19222* (LL, fruit),

tree, 50 ft. high, 8 in. diam., fruit green, with peppermint fragrance; Chilasco, San Jorge, 5 km., in high forest on hill, Aug. 8, 1971, *Contreras 10984* (LL), tree, 6 in. diam., 25 ft. high, "*aguacate de Mico.*"

Contreras 10984, with mature fruit, was identified as *P. Steyermarkii* Allen, on the basis of its small leaves and fruits. With flowers available, the relationship of *P. perglauca* is not clear. The very small flowers, scarcely half as large as in *P. Steyermarkii*, and reduced few-flowered inflorescences are unusual in the subgenus *Persea*, to which *P. perglauca* is referable.

CELASTRACEAE

Quetzalia mayana (Lundell & Williams) Lundell, comb. nov. *Microtropis mayana* Lundell & Williams, Wrightia 5: 80. 1975.

TILIACEAE

Sloanea cruenta Lundell, sp. nov. — Arbor, ad 26 m. alta, 1 m. diam., ramulis novellis tomentosis; folia longe petiolata, petiolo 2–6 cm. longo, parce puberulo; lamina glabra, subchartacea, lanceolato-elliptica, ovata vel oblanceolata, 9.5–25 cm. longa, 3.5–11 cm. lata, apice late acuminata, basi rotundata et emarginata; flores ignoti; infructescentia 1- vel 2-flora, ad 5.5 cm. longa, dense puberula; pedicelli fructiferi ad 4 cm. longi; capsula cruenta, ellipsoidea, ca. 2.5 cm. longa; valvae 4, ad 2 mm. crassae; extus densissime spinosae; spinae 2.5–3 mm. longae, antrorse hispidulae.

Large tree, up to 26 m. tall, 1 m. diam., the branchlets usually thick, densely tomentose with fine hairs, glabrate with age; leaves alternate, large, with slender nearly terete petioles 2–6 cm. long, puberulent at apex above, otherwise glabrous; leaf blades thin, paler beneath, subchartaceous, puberulent at base of midvein above at maturity, otherwise glabrous, usually lanceolate-elliptic, or ovate, sometimes widest above middle, 9.5–25 cm. long, 3.5–11 cm. wide, apex acuminate, the acumen broad and obtuse, base rounded or truncate and conspicuously emarginate, the midvein stout and elevated beneath, nearly plane above, the primary lateral nerves up to 14 pairs, slender but conspicuous, arcuately ascending, veins openly and finely reticulate, evident above; fruiting inflorescence with 1- or 2-fruits, up to 5.5 cm. long including stout pedicels up to 4 cm. long, densely puberulent; capsules reddish-purple, 4-valved, ellipsoid, about 2.5 cm. long, densely covered with slender reddish-purple setae 2.5–3 mm. long, the setae with short antrorse hairs, these rather sparse, the valves woody, 1.5–2 mm. thick.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, east of km. 154 of the road, April 16, 1975, *C. L. Lundell & Elias Contreras 19216* (LL, type), tree, 80 ft. high, 40 in. diam., fruit blood-red, drying purplish-red.

With only fruiting specimens available, the position of the taxon can not be ascertained, but I have been unable to associate it with any of the Mexican and Central American species treated in the monograph by C. Earle Smith, Jr. (Contr. Gray Herb. 175: 1–114. 1954).

MYRTACEAE

Calyptranthes mayana Lundell, sp. nov. – Arbor, ca. 17 m. alta, 25 cm. diam., ramulis glabratis; folia glabrata, petiolata, petiolo crasso, 3.5–4.5 mm. longo, canaliculato; lamina coriacea, obovata vel elliptica, 6–10.5 cm. longa, 3.3–5 cm. lata, apice subabrupte acuminata, basi obtusa vel acutiuscula, supra minute punctata; inflorescentia paniculata, 7.5–14 cm. longa, pauciflora, glabrata; pedicelli nulli vel ad 5 mm. longi; alabastra obovoidea, ad 5 mm. longa, apiculata; hypanthium campanulatum; calyptra ad 3.5 mm. diam.; stamina numerosa, ad 8 mm. longa; stylus ca. 12.5 mm. longus; ovarium 3-loculare.

Tree, up to 17 m. tall, 25 cm. diam., branchlets at first slightly compressed, rather sparingly pubescent with reddish appressed dibrachiate hairs; leaves glabrate, with some short dibrachiate hairs persisting, especially along midvein and on petioles, the petioles thick, 3.5–4.5 mm. long, canaliculate, drying reddish-black; leaf blades coriaceous, paler beneath, obovate or elliptic, 6–10.5 cm. long, 3.3–5 cm. wide, apex rather subabruptly short acuminate, base mostly obtuse or rounded, sometimes acutish, the upper surface smooth, obscurely and minutely punctate with impressed glands; the midvein elevated beneath, sharply impressed above, the primary lateral veins mostly 12–14 pairs with conspicuous intermediaries, elevated beneath, nearly straight at a wide angle, anastomosing into submarginal vein, the veins obscure above; inflorescence large, with scattered reddish small dibrachiate hairs, 8–20-flowered, the flowers large, the paired panicles compound, 7.5–14 cm. long; peduncles somewhat flattened, stout, 2–3 mm. wide, 5–8.5 cm. long, the secondary branches of inflorescence flattened, up to 3 cm. long, the flowers 1–3 terminating the branches, subsessile to pedicellate, the pedicels sometimes up to 5 mm. long; flower buds obovoid, up to 5 mm. long, apiculate, pubescent with reddish dibrachiate appressed hairs; hypanthium companulate at anthesis, prolonged 3 mm. above ovary, glabrous within; calyptra up to 3.5 mm. diam.; petals 4 or 5, small, lanceolate, 2–4 mm. long, attached to the calyptra; stamens numerous, up to 8 mm. long; style stout, about 12.5 mm. long; ovary with 3 locules, ovules 6, paired in each locule.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, east of km. 151, on top of hill, April 15, 1975, *C. L. Lundell & Elias Contreras 19199* (LL, type), tree, 50 ft. high, 10 in. diam., flowers white, "*guayabillo.*"

C. mayana is a striking species with its large, stout, compressed, paired myrcioid panicles up to twice the length of leaves, large flowers, 8–20 per panicle, and scant appressed dibrachiate pubescence. The ovary is 3-loculate, with paired ovules in each locule.

C. Tonii Lundell of Chiapas appears to be closely related, but differs noticeably in having mostly lanceolate, long-acuminate leaves, and with collar of fruits only half as large with correspondingly smaller calyptra.

SAPOTACEAE

Dipholis Contrerasii (Lundell) Lundell, comb. nov. *Bumelia Contrerasii* Lundell, Wrightia 5: 89. 1975.

Guatemala: Dept. Peten, La Cumbre, km. 138/139 of Cadenas Road, in high forest, July 27, 1969, *Elias Contreras 8872* (LL), tree, 60 ft. tall,

18 in. diam.; La Cumbre, on Cadenas Road, km. 142, in high forest, *zapotal-corozal*, Sept. 1, 1969, *Contreras 9035* (LL), tree, 50 ft. tall, 15 in. diam. Dept. Izabal, Cadenas, Toquela River Road, 5 km. from the village, in high forest, *corozal-zapotal*, Sept. 5, 1969, *Contreras 9065* (LL), tree, 70 ft. tall, 18 in. diam.; Cadenas, in *corozal*, high forest, Sept. 1969, *Contreras 9148* (LL), tree, 60 ft. tall, 24 in. diam., fruits warty.

On the basis of fruiting collections now available, the species should be referred to *Dipholis*. *Dipholis* is amply distinct from *Bumelia*, considering generic limits in the family, and should be recognized. The fruits of *D. Contrerasii* are warty at maturity, ellipsoid, about 3 cm. long, and narrowed to the base. The apex of the young fruits abruptly tapers to the style. The tree is unarmed.

VOLUME 5 NOVEMBER, 1975 NUMBER 6

WRIGHTIA

A BOTANICAL JOURNAL

CONTENTS

PUBLISHED BY
THE UNIVERSITY OF TEXAS AT DALLAS
Richardson, Texas

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. The contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume will contain a series of numbers. The numbers will be issued at irregular intervals.

VOLUME 5, NUMBER 6
ISSUED NOVEMBER 28, 1975

Printed in the U.S.A.
Etheridge Printing Company
Dallas, Texas

WRIGHTIA

VOLUME 5 NOVEMBER, 1975 NUMBER 6

STUDIES OF AMERICAN PLANTS–X

CYRUS LONGWORTH LUNDELL[1]

In the Spring of 1928 I accepted appointment as Assistant Physiologist of the Tropical Plant Research Foundation with headquarters in Washington, D. C. Reporting to W. A. Orton, Director of the Foundation in Washington, he suggested that I visit the Smithsonian Institution to look over the collections of *Achras Zapota* L. in the United States National Herbarium. I was to serve as field assistant to John S. Karling in British Honduras to undertake tapping experiments on the sapodilla tree for the chicle industry, which sponsored the project through the Tropical Plant Research Foundation.

At the Smithsonian Institution I met William R. Maxon. He introduced me to the herbarium, and when I left he presented me with a plant press, my first, and encouraged plant collecting in British Honduras, a region still little known botanically in 1928.

At the time of my appointment in 1928, I was a sophomore at Southern Methodist University, so my initiation into a botanical career was early and precipitous.

A report on the chicle industry, with a bibliography, was published by John S. Karling in 1943 in volume 42 of Torreya. I had published an earlier paper, *Chicle Exploitation in the Sapodilla Forest of the Yucatan Peninsula* (Field Lab. 2: 15–21, 2 figs. 1933). My work with the Tropical Plant Research Foundation at Honey Camp in British Honduras extended through two seasons, June, 1928 to January, 1929, and July to November, 1929, with the spring interval in 1929 as a student at Columbia University. Figs. 8 through 14.

My plant collecting in the Yucatan Peninsula, inaugurated with the single plant press furnished by the Smithsonian Institution, has continued almost without interruption since 1928. Field trips have been supplemented by year-round work of local assistants, the most notable being the late Percy H. Gentle in British Honduras (1933-1958), and Elias Contreras in Guatemala and British Honduras, who started his collecting with me at Tikal in 1959, and continues.

Since my professional career began with experimental work on *Achras Zapota*, I have maintained an interest in the Sapotaceae. Until recently my taxonomic efforts were confined to the description of new species found in the course of identifying general collections from Middle America. Now a study is underway to reevaluate the taxa in the Maya area. With intensified field work on the Sapotaceae, aided by Elias Contreras,

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year-round collections of flowering and fruiting material are accumulating which make possible a better understanding of the genera and species. The preparation of a synopsis is underway covering the family in the Yucatan Peninsula and adjacent areas.

The account of the Mexican and Central American species of *Ficus* by Paul C. Standley (United States Nat. Herb. 20: 1–35. 1917), although very outdated, is the most useful treatment of the genus for our area. The Gordon P. Dewolf, Jr. contribution on *Ficus* in the *Flora of Panama* (Ann. Mo. Bot. Garden 47: 146–165. 1960) clarifies relationships in the neotropics, but is limited in scope. In the *Flora of Guatemala* (Fieldiana: Bot. 24, pt. 3: 30–48. 1952) a total of thirty-one native and cultivated species are included, but the material available in 1952 did not represent the diversity of populations in the area.

With the numerous additional collections of *Ficus* now at hand, it is possible to recognize additional taxa which appear to be undescribed. There is still a need for intensive field work to clarify the status and relationships of various species. Mostly large trees or woody epiphytes, the wild figs are not easy to collect, hence so poorly known.

Aside from a new genus, *Manilkariopsis*, several new species together with notes on other Sapotaceae, the description of nine new species of *Ficus*, various new or otherwise noteworthy taxa are included herewith in the families Polygonaceae, Leguminosae, Rutaceae, Euphorbiaceae, Myrtaceae and Solanaceae.

I am indebted to the Field Museum of Natural History, the Gray Herbarium, the Herbarium of the University of Michigan, the New York Botanical Garden, and the United States National Herbarium for making available on loan numerous types and other material used in these studies.

MORACEAE

Ficus albotomentosa Lundell, sp. nov. – Arbor, ramuli crassi, pubescentes; stipulae adpresse pubescentes, ad 1.3 cm. longae; folia pubescentia, parva, petiolata, petiolo 0.8–1.8 cm. longo; lamina rigide coriacea, subtus pilosa, supra glabrata, elliptica vel anguste elliptica, ad 10 cm. longa, 4 cm. lata, apice obtusissima vel interdum apiculata, basi obtusa, costa crassa, nervis lateralibus 5–9-jugis, basi obscure subtrinervis; receptacula geminata, pedunculata, globosa, ad 1.7 cm. diam., dense albotomentosa; involucrum symmetricum, adpresse hirsutum, bilobum.

←

Fig. 8. Honey Camp, Orange Walk District, British Honduras, field headquarters in 1928-1929 where tapping experiments and other studies on *Achras Zapota* L. were carried out by the staff of the Tropical Plant Research Foundation, a project sponsored by the chicle industry. The living quarters are at right, the laboratory building is at left. Honey Camp Lagoon is in foreground. The cropped trees in the background are the *ramon*, *Brosimum Alicastrum* Sw., the leaves of which are the chief source of fodder in the forest of the Yucatan Peninsula.

Tree, branchlets thick, hispidulous and short pilose, the leaves aggregated at ends of twigs; stipules up to 1.3 cm. long, pubescent with loose subappressed hairs; leaves small, short-petiolate, the petioles stout, 0.8–1.8 cm. long, canaliculate, short-pilose; leaf blades rigidly coriaceous, persistently soft-pilose beneath with short hairs, glabrate above, elliptic or narrowly oblong-elliptic, 5.5–10 cm. long, 2.1–4 cm. wide, apex rounded, broadly obtuse or apiculate, base broadly obtuse-rounded, the costa prominent and elevated beneath, shallowly sulcate above, the base of leaf rather obscurely trinerved, the primary lateral veins 5–9-pairs, very slender, arcuately ascending and anastomosing, the reticulation open, the veins obscure and slightly impressed above; receptacles geminate, the peduncles stout, 6–8 mm. long, densely pilose and strigose apically; involucres symmetric, deeply bilobed, the lobes ovate, 3–3.3 mm. long, free, rigid, strigose, glabrous within; receptacles globose, up to 1.7 cm. in diam., densely white-tomentose; ostiole 2–3 mm. in diam., with dark-brown coriaceous elevated scales, nearly glabrous.

Mexico: Chiapas, Trapichito, near Comitan, June 2, 1945, *Eizi Matuda 5964* (LL, type).

I have not seen the type of *F. Morazaniana* Burger, but that taxon is described as having much larger leaves than *F. albotomentosa* and apparently there are other dissimilarities in pubescence, shape of receptacle, and size of involucre. The upper leaf surface of *F. albotomentosa* is glabrate, the persistent soft hairs on the lower surface are short, rarely up to 0.4 mm. long, and very variable in length. The bracts are smaller and strigose.

The Matuda collection had been identified earlier as *F. lapathifolia* (Liebm.) Miq., which is reported to belong to the subgenus *Pharmacosyce*.

In *F. albotomentosa* rather deep sockets persist in the axils where peduncles of the figs have fallen.

Ficus belizensis Lundell, sp. nov. — Arbor magna; ramuli crassiusculi, dense puberuli; stipulae dense puberulae; folia basi puberula, subglabra, supra albida, petiolata, petiolo dense puberulo, 1–2 cm. longo; lamina subcoriacea, elliptica vel oblongo-elliptica, ad 10.5 cm. longa, 5.3 cm. lata, apice obtusa vel obtuso-rotundata, basi rotundata vel late obtusa, trinervia, nervis lateralibus 5–7-jugis; receptacula geminata, pedunculata, depresso-globosa, ad 11 mm. diam., albida, glabrata, ostiolo ad 3 mm. diam.; involucrum liberum, bilobatum, symmetricum, ca. 3 mm. longum, minute puberulum.

Large tree, the branchlets rather stout, densely and minutely puberulent at first, glabrate; stipules about 1 cm. long, densely puberulent; leaves with puberulent canaliculate petioles 1–2 cm. long; leaf blades subcoriaceous, pallid, drying whitened above, brownish beneath, puberulent, glabrate except at base and along midvein above, densely and minutely punctate above, elliptic or oblong-elliptic, 5–10.5 cm. long, 2.3–5.3 cm. wide, apex obtuse, obtuse-rounded or obtusely apiculate, base rounded or broadly obtuse, distinctly trinerved with lesser veins below, the primary lateral veins slender, 5–7-pairs, rather acutely ascending, anastomosing near margin, less evident above, the reticulation inconspicuous;

receptacles geminate, pedunculate, the peduncles mostly short, 2–6.5 mm. long, the receptacles depressed-globose, up to 11 mm. in diameter, glabrate, drying whitish, not mottled or otherwise marked, the ostiole up to 3 mm. in diameter, flat or the scales raised slightly; involucre free, bilobed with the lobes split, symmetric, about 3 mm. long, densely and minutely puberulent.

British Honduras: El Cayo District, Benque Viejo, Rio Mopan, on riverbank, Doña Reineria Ranch, in clearing, *C. L. Lundell & Elias Contreras 18284* (LL, type), tree, 80 ft. high, 25 in. diam., "*higo.*"

The leaves drying whitened, the dense puberulent indument of most parts, and the short-peduncled receptacles are notable traits of this species. Its relationship is to *F. ovalis* (Liebm.) Miq., a species complex as now interpreted which needs further study.

Ficus galeata Lundell, sp. nov. – Arbor magna; ramuli pubescentes; stipulae ad 1.8 cm. longae; folia minute puberula et parce hirsuta, petiolata, petiolo 1–2 cm. longo; lamina chartacea, ovalia vel obovato-ovalia, ad 15 cm. longa, 8 cm. lata, apice late rotundata, raro apiculata, basi late obtusa, rotundata vel emarginata, nervis lateralibus 6–8-jugis; receptacula geminata, pedunculata, globosa, ca. 2 cm. diam., minute puberula et parce hirsuta, apice umbonata; involucrum symmetricum, bilobum, liberum, lobis late rotundatis, 3–4 mm. longis.

Large tree, the branchlets thick, thinly hirsute and densely puberulent; stipules up to 1.8 cm. long, minutely puberulent and strigose dorsally, densely so at base; axillary buds with helmet-like cover, the helmets ovoid, spiked, 5–9 mm. long, hollow, abruptly contracted into a terminal spike up to 3.5 mm. long, puberulent and hirsute; leaves petiolate, the petioles drying black, minutely puberulent and sparsely hirsute, 1–2 cm. long, canaliculate; leaf blades chartaceous, paler beneath, sparsely hirsute on lower surface along costa and primary and secondary veins, nearly glabrous above, oval or obovate-elliptic, 7–15 cm. long, 3.7–8 cm. wide, apex broadly rounded, sometimes apiculate, base rounded, broadly obtuse or slightly emarginate, 3-nerved at base with two slender nerves below, the primary lateral veins 6–8-pairs, slender, anastomosing near the margin, whitened and evident above, openly reticulate, the midvein stout, elevated beneath, slightly elevated above; receptacles geminate, pedunculate, the peduncles stout, 5–8 mm. long, minutely puberulent and sparsely hirsute; involucre bilobed, the lobes broadly rounded, 3–4 mm. long, symmetric, puberulent and hirsute; receptacles globose, about 2 cm. in diameter, minutely and densely puberulent, very sparsely hirsute; the ostiole 3.5–4 mm. in diam., with a shallow elevated ring of thickened tissue.

Guatemala: Dept. Peten, Tikal, in *ramonal* covering the ruins, Jan. 14, 1962, *C. L. Lundell 17091* (LL, type), tree, 36 in. diam., 125 ft. high.

F. galeata is to be recognized by the spiked helmets covering buds in the leaf axils, combined with the heterotrichous indument of all parts. I originally referred the collection to *F. trigonata* L. of the subgenus *Urostigma*, to which the taxon is related. *F. yucatanensis* Standl. belongs to the complex.

Ficus izabalana Lundell, sp. nov. — Epiphytica; ramuli crassi, hirsuti; stipulae strigosae; folia magna, pubescentia, longe petiolata, petiolo ad 4.5 cm. longo; lamina obovato-oblonga, ad 19 cm. longa, 9 cm. lata, apice acuta vel subacuminata, basi rotundata, emarginata, supra puberula, subtus pilosa, nervis lateralibus 10–13-jugis; receptacula geminata, sessilia, subglobosa, ad 1.3 cm. diam., dense rufo-sericea, ostiolo ad 2.5 mm. diam.; involucrum bilobatum, symmetricum, liberum, utrinque sericeum, lobis late rotundatis, ad 6 mm. longis.

Epiphytic, strangler fig, the branchlets thick, hirsute at first; stipules about 1 cm. long, strigose; leaves large, petiolate, the petioles 1.4–4.5 cm. long, densely pubescent with rather short fine subappressed hairs; leaf blades chartaceous, obovate-oblong, 7.5–19 cm. long, 3.5–9 cm. wide, the smaller leaves on short lateral lower branchlets, apex acute or short acuminate, base rounded and emarginate, persistently short-pilose over entire lower surface, puberulent above, hairs densest along costa and veins, the midvein thick and elevated beneath, shallowly impressed above, 5-nerved at base, the lateral nerves slender and inconspicuous, primary lateral veins in larger leaves slender, ascending at a rather acute angle, 10–13-pairs, with fewer pairs on small leaves of lateral shoots, the primary veins slender but prominent beneath, inconspicuous above, the reticulation fine and open; receptacles geminate, sessile, depressed-globose, drying costate, up to 1.3 cm. in diameter, densely and persistently sericeous with reddish hairs, the ostiole slightly raised or depressed, 2–2.5 mm. in diam.; involucre free, bilobate, densely sericeous on both surfaces with long reddish hairs, the lobes broad, rounded at apex, up to 6 mm. long.

Guatemala: Dept. Izabal, Cadenas, in high forest, *zapotal,* bordering San Felipe Road, km. 7, Oct. 4, 1969, *C. L. Lundell & Elias Contreras 18285* (LL, type), epiphytic, on tree 80 ft. high.

F. izabalana is related to *F. Popenoei* Standl., but distinct in its much longer petioles, larger leaves emarginate at base, primary lateral veins 10–13-pairs, and densely sericeous, irregularly costate, depressed-globose, sessile receptacles. The pubescence of *F. izabalana* is persistent on all parts. The receptacles of *F. Popenoei* are cylindric, very distinct from the depressed-globose figs of *F. izabalana. F. inamoena* Standl. resembles the new taxon, but differs in its short petioles, cordate leaf base, and in having receptacles glabrous or nearly so.

Ficus lacandonensis Lundell, sp. nov. — Arbor magna; ramuli crassiusculi, apice parce puberulenti; stipulae ad 12 mm. longae, pubescentes; folia parva, glabra, petiolo 5–13 mm. longo; lamina subcoriacea, ovalia, ovato-cordata vel elliptico-oblonga, 3.5–8.5 cm. longa, 2.1–4.7 cm. lata, apice late rotundata, raro obtusiuscula, basi cordata vel emarginata, trinervia, nervis lateralibus 3–5-jugis; receptacula geminata, glabra, pedunculata, globosa, ca. 1 cm. diam., apice bracteolis elevatis; involucrum bilobum, lobis late ovatis, obtusiusculis, extus rufo-puberulis.

Large tree, the branchlets rather slender, especially the short lateral ones, the apical internodes minutely puberulent, glabrate; stipules up to 12 mm. long, puberulent at first and appressed pubescent dorsally;

leaves glabrous, petiolate, 5–13 mm. long, canaliculate, with prominent gland at apex on lower surface; leaf blades subcoriaceous, oval, ovate-cordate or elliptic-oblong, 3.5–8.5 cm. long, 2.1–4.7 cm. wide, apex broadly rounded, rarely slightly narrowed and obtusish, base cordate with narrow sinus or emarginate, midvein elevated beneath, slightly depressed and rounded above, 3-nerved at base, the primary lateral veins 3–5-pairs, slender and arcuately anastomosing, minutely areolate beneath, the reticulation fine; receptacles geminate, pedunculate, globose, about 1 cm. in diameter, greenish and inconspicuously mottled, the ostiole 3 mm. in diam., nearly plane, the overlapping scales raised; peduncles thick, 2–2.5 mm. long, reddish puberulent; involucre bilobed, the lobes broadly ovate, obtusish, about 3 mm. long, pubescent within at base, puberulent on outer surface.

Guatemala: Dept. Peten, Lacandon, on El Caribal trail, about 3 km. SW in high forest, Feb. 16, 1962, *Elias Contreras 3398* (LL, type), tree, 30 in. diam., 90 ft. high, figs greenish, *"copo," "matapalo."*

Although glands are present on the midvein near base of blades in various species, the glands at the apex of the petiole of *F. lacandonensis* are conspicuous, arising above the conjunction of the three basal nerves. The short peduncles and reddish but minute indument, the small ovate-oblong areolate leaves usually cordate at base with narrow sinus are other outstanding traits. A relationship to *F. ovalis* (Liebm.) Miq. is probable.

Ficus mayana Lundell, sp. nov. – Arbor; ramuli crassi, minutissime puberuli vel fere glabri; stipulae attenuatae, ad 2.5 cm. longae; folia petiolata, petiolo 2–5 cm. longo; lamina coriacea, obovato-oblonga vel obovato-elliptica, 6–13 cm. longa, 2.5–6 cm. lata, apice subabrupte acuminata vel acuta, basi rotundata vel subtruncata, emarginata, nervis lateralibus 9–13-jugis; receptacula geminata, sessilia vel substipitata, 8–10 mm. diam., novella adpresse rufo-puberula, apice annulata, crateriforma; involucrum coriaceum, symmetricum, bilobatum, recaptaculo brevius.

Tree, about 16 m. high, 20 cm. in diam.; branchlets thick, with very short internodes, puberulent and with traces of minute red appressed hairs; stipules up to 2.5 cm. long, minutely puberulent, glabrate; leaves petiolate, the petioles 2–5 cm. long, canaliculate, minutely and obscurely puberulent at first; leaf blades coriaceous, paler beneath, obovate-oblong or obovate-elliptic, 6–13 cm. long, 2.5–6 cm. wide, apex usually subabruptly short acuminate, or acute, the acumen acute, base rounded or subtruncate, emarginate, obscurely and minutely puberulent at first on both surfaces, especially along the costa and veins, with short appressed red hairs intermixed along midvein on lower surface, the midvein elevated beneath, nearly plane above, 5–7-veined at base, the primary lateral veins slender, widely ascending, 9–13-pairs, anastomosing into submarginal vein, with intermediaries evident, areolate beneath; receptacles geminate, sessile, or short stipitate, with sockets in twigs, the figs subglobose, 8–10 mm. in diameter, at first puberulent with minute scattered red appressed hairs, glabrate, apex crateriform, rather conspicuous with a smooth elevated ring about 3 mm. in diameter surrounding ostiole, the

ostiole depressed, with the scales overlapping; involucre shallowly bilobate, symmetric, free, not adherent to receptacle at base, the lobes broadly rounded, covering one-half to two-thirds of receptacle, at first puberulent with short red hairs, glabrate, glabrous on inner surface.

Guatemala: Dept. Peten, La Cumbre, in low forest, *zapotal*, on top of hill, west of km. 141/142 of road, May 9, 1975, *C. L. Lundell & Elias Contreras 19266* (LL, type), tree, 50 ft. high, 8 in. diam., figs yellow-green, mottled.

F. mayana is closely related to *F. Lundellii* Standl., differing in its larger long-petioled leaves acute at apex and emarginate at base, and in having larger receptacles crateriform at apex with well-developed annular ring of tissue surrounding the depressed scales. Both species, like *F. Tuerckheimii*, have sockets in leaf axils where the receptacles are borne. In *F. Tuerckheimii*, as in *F. Lundellii*, the leaves are not emarginate at base. Both *F. mayana* and *F. Lundellii* are minutely areolate on lower leaf surface.

F. Lundellii appears to be restricted to the lowlands of central Peten, while *F. mayana* is a species of the Maya Mountains, and it also occurs in Chiapas at elevations up to 4800 feet.

Ficus paraisoana Lundell, sp. nov. — Arbor, 8 m. alta; ramuli crassi vel crassiusculi, pubescentes; stipulae ad 1 cm. longae, basi adpresse hirsutae, apice glabrae; folia petiolata, petiolo striato, hirsuto, 1–2.6 cm. longo; lamina subcoriacea, utrinque pilosa, ovalia vel oblongo-elliptica, 4–10 cm. longa, 3.3–6.8 cm. lata, apice rotundata, basi rotundata et emarginata, tri- vel 5-nervia, nervis lateralibis 3- vel 4-jugis, costa crassa; receptacula geminata, pedunculata, subglobosa, ad 8 mm. diam., glabrata, apice crateriforma; involucrum parvum, utrinque parce sericeum, lobis late rotundatis, 2–3 mm. longis, ciliatis.

Small tree, the branchlets short, drying blackish, hirsute; stipules up to 1 cm. long, appressed hirsute at base, glabrous above; leaves small, petiolate, the petioles striate, blackish, short hirsute, 1–2.6 cm. long, rather stout; leaf blades subcoriaceous, pilose on both surfaces, the hairs shorter on upper surface, oval or oblong-elliptic, 4–10 cm. long, 3.3–6.8 cm. wide, apex broadly rounded, base rounded and emarginate, costa prominent, conspicuously 3–5-nerved at base, the principal lateral nerves 3- or 4-pairs, slender but prominent beneath, irregular and arcuately ascending, anastomosing, the veins and veinlets less evident above; receptacles geminate, pedunculate, the peduncles 3–5 mm. long, rather thick, nearly glabrous, the receptacles subglobose, up to 8 mm. in diam., glabrate, the apex crateriform with the scales of ostiole depressed; involucre small, chartaceous, rather sparsely sericeous on both surfaces, bilobed, the lobes broadly rounded, 2–3 mm. long, sometimes splitting irregularly, ciliate.

Honduras: Dept. El Paraiso, orillas del Rio Dantas entre Yuscaran y Fatima, alt. 1100 m., Dec. 28, 1962, *Louis O. Williams & Antonio Molina R. 11197* (LL, type), arbol 8 m.

Resembling *F. ovalis* (Liebm.) Miq. in leaf form, that species is essentially glabrous in all parts. *F. paraisoana* has leaves velvety to

the touch on lower surface, hirsute branchlets and petioles, larger receptacles, and an involucre with ciliate lobes and both surfaces rather sparsely sericeous.

There are a number of very distinct *Ficus* taxa in the Maya area with similarly shaped mostly oval leaves.

Ficus rigidula Lundell, sp. nov. – Arbor, ca. 13 m. alta; ramuli crassi, dense et minute puberuli; folia parva, petiolata, petiolo 1.2–3 cm. longo, minute puberulo; lamina coriacea, rigida, late ovata vel ovato-elliptica, 4–8 cm. longa, 3.5–7 cm. lata, apice rotundata, basi late cordata, 5- vel 7-nervia, novella minute puberula, glabrata, nervis lateralibus 5–7-jugis; receptacula geminata, subsessilia, glabra, subglobosa, ad 1.2 cm. diam., apice umbonata; involucrum coriaceum, bilobum, liberum, extus puberulentum, intus glabrum, lobis late rotundatis, ad 1 cm. longis.

Tree, about 13 m. high, the branchlets thick, with short internodes, rigid, densely and minutely puberulent, whitened on drying; stipules up to 1.5 cm. long, puberulent; leaves small, paler beneath, crowded at apex of short thick branchlets, rigidly coriaceous, petiolate, the petioles densely puberulent, 1.2–3 cm. long, those of larger leaves thick; leaf blades somewhat puberulent at first, broadly ovate or ovate-elliptic, 4–8 cm. long, 3.5–7 cm. wide, apex rounded, sometimes obscurely and broadly obtuse-apiculate, base widely cordate with rounded basal lobes, costa thick and prominent on both surfaces, the basal veins 5–7, the primary lateral veins 5–7-pairs, slender but prominent on both surfaces, nearly straight and wide angled, arcuately anastomosing near the margin; receptacles geminate, the short thick peduncles 2–2.5 mm. long, densely puberulent, borne in well-developed sockets which persist after figs have fallen, the receptacles spotted, subglobose, up to 1.2 cm. diam., glabrous, the ostiole 2–2.5 mm. in diam., the scales elevated; involucre brown, deeply bilobed, thickened below, glabrous within, puberulent on outer surface, free to base, the lobes broadly rounded, up to 1 cm. long, covering three-fourths or more of receptacle.

Mexico: Chiapas, Municipio of Tuxtla Gutierrez, 3 km. north of Tuxtla Gutierrez along road to El Sumidero, elev. 1800 ft., April 7, 1965, *D. E. Breedlove 9568* (LL, type), tree 40 ft. tall.

Of the subgenus *Urostigma,* the species is notable for the broad basal sinus of its small rigidly coriaceous leaves, its puberulent indument, subsessile receptacles, and large brown coriaceous bilobed involucre covering most of the receptacle. *F. rigidula* is suggestive of *F. cotinifolia* H.B.K., a species with altogether different indument, sessile receptacles and a much smaller involucre.

Ficus venosissima Lundell, sp. nov. – Arbor magna; ramuli crassi, parce pubescentes, glabrati; stipulae ad 1.5 cm. longae, strigosae; folia longe petiolata, petiolo ad 5 cm. longo; lamina chartacea, subtus pilosa, supra glabrata, undulata, elliptica vel oblongo-elliptica, ad 22 cm. longa, 12 cm. lata, apice rotundata, abrupte apiculata, basi anguste rotundata, venosissima, reticulata, basi obscure 3–5-nervia, nervis lateralibus 9–13-jugis; receptacula geminata, pedunculata, ellipsoidea vel obovoidea, ad

1.5 cm. longa, minute et dense puberula, ostiolis crateriformis; involucrum symmetricum, bilobum, liberum, lobis ad 3.7 mm. longis, ciliolatis.

Large tree, the branchlets thick, rather sparsely hirsute and puberulent, glabrate, the epidermis brownish; stipules up to 1.5 cm. long, strigose; leaves large with stout blackish petioles up to 5 cm. long, the petioles sparsely pubescent; leaf blades chartaceous, paler and brownish beneath, thinly pilose over entire lower surface, nearly glabrous above except along the midvein, the margin undulate, the blades elliptic or oblong-elliptic, up to 22 cm. long, 12 cm. wide, apex rounded and abruptly apiculate, the point acutish or obtuse, base narrowed and rounded, midvein thick and elevated beneath, nearly plane above, the basal nerves weak and inconspicuous, the primary lateral veins slender but conspicuous, 9–13-pairs, anastomosing, the reticulation fine and open, conspicuous beneath, less evident above; receptacles geminate, pedunculate, the peduncles thick, 2.5–3.7 mm. long, puberulent and with scattered longer silky hairs, the fig (immature) ellipsoid or obovoid, up to 1.5 cm. long, minutely and densely puberulent and with scattered silky hairs; the ostiole about 3 mm. in diameter, crateriform, with a ring of thickened tissue elevated about 0.7 mm., the scales depressed; involucre bilobed, with disc-like thickening at base of lobes, the lobes free to base, up to 3.7 mm. long, ciliolate, deciduous.

Guatemala: Dept. Alta Verapaz, Rio Sebol, Randal Grande, on riverbank, May 9, 1964, *Elias Contreras 4649* (LL, type), tree, 35 in. diam., 90 ft. high, *"chimon," "higo."*

The peculiar disc-like thickening at the base of the fruits with the lobes of the involucre falling as the fig matures is a distinguishing feature, but not unique. *F. venosissima* belongs in the *F. trigonata* L. complex, and probably is related to *F. Morazaniana* Burger which has much denser pubescence.

A sterile collection from Tikal, *Lundell 17126* (LL), a strangler fig, 80 ft. high, appears to be referable to *F. venosissima*.

POLYGONACEAE

Coccoloba cumbreana Lundell, sp. nov. — Arbor, ramulis glabris; ocreis chartaceis, ad 1 cm. longis, dense rufo-hirtellis, apice rufo-barbatis; petiolis ad basem acreis gerentibus, glabris, crassis, 8–13 mm. longis; lamina glabra, coriacea, lanceolata vel ovato-lanceolata, ad 12 cm. longa, 5.5 cm. lata, apice acuminata, basi rotundata, inaequilateralia, nervis primariis 5 vel 6; flores dioeci; inflorescentia racemosa, glabra, ad 5 cm. longa; ocreolae 0.5–1 mm. longae; pedicelli crassi, 2–3 mm. longi; calyx stipitatus, campanulatus, lobis 5, late ovato-rotundatis; stamina 5, filamenta 2–2.7 mm. longa; staminodia (flores feminei) 7 vel 8, ca. 1 mm. longa; ovarium ovoideum, 2–2.4 mm. longum; stylus 3, elongatus.

Tree, up to 20 m. tall, 25 cm. diam., glabrous except for the rufous-hirtellous barbate ocreae, the branchlets mostly short, rather slender; leaf scar slightly above base of ocreae, the ocreae less than 1 cm. long, at first densely rufous-hirtellous and barbate at apex, glabrate but with bases of hairs evident, usually some hairs persistent above leaf scar;

leaves with stout petioles, the petioles of mature blades 8–13 mm. long; leaf blades coriaceous, glabrous, lanceolate or ovate-lanceolate, 6.5–12 cm. long, 2.7–5.5 cm. wide, apex acuminate, the acumen obtusish to acute, base rounded, sometimes emarginate at first, inaequilateral, the midvein thick, prominent beneath, elevated above, the primary lateral veins 5- or 6-pairs, widely arcuately ascending, rather conspicuous beneath, less so above, the venation finely reticulate on both surfaces; inflorescence racemose, strictly glabrous. *Staminate flowers (Lundell & Contreras 19268):* rachis of raceme stout, up to 5 cm. long, the flowers usually 3 at each node, sometimes only 1 or 2, the bracts and ocreolae at base of pedicels very thin, transparent, short, less than 0.5 mm. long, glabrous; pedicels stout, up to 3 mm. long; calyx stipitate at base, the tube at anthesis narrowly campanulate, the 5 lobes reflexed, broadly ovate, 2.5–3 mm. long, rounded at apex; stamens 5, with slender erect filaments 2–2.7 mm. long, the anthers suborbicular, emarginate at apex and base, about 0.8 mm. long; ovary abortive, with three slender abortive styles. *Pistillate flowers (Lundell & Contreras 19281):* rachis of raceme stout, 2.5–4 cm. long, the flowers few, usually solitary at each node, the bracts and ocreolae at base of pedicels very thin, transparant, up to 1 mm. long in pistillate flowers, glabrous; pedicels stout, 2–3 mm. long; calyx stipitate at base, the tube campanulate, the 5 lobes spreading at anthesis, broadly ovate-rounded, 2–2.5 mm. long; abortive stamens more numerous than lobes, mostly 7 or 8, about 1 mm. long, the filaments triangular, united at base; ovary ovoid, smooth, 2–2.4 mm. long, with three slender styles slightly shorter than ovary, the stigmas elongate, introrse with papillate surface; the calyx tube accrescent in fruit.

Guatemala: Dept. Peten, La Cumbre, in low forest, *zapotal,* on top of hill, east of km. 142/143 of the road, May 11, 1975, *C. L. Lundell & Elias Contreras 19281* (LL, type), tree, 30 ft. high, 4 in. diam., pistillate flowers green, ocrea rufous-hirtellous with barbate apex; same locality, May 9, 1975, *Lundell & Contreras 19268* (LL), tree, 65 ft. high, 8 in. diam., staminate flowers greenish, ocrea rufous-hirtellous with barbate apex; same area, *Lundell & Contreras 19273* (LL), *19284* (LL), staminate flowers.

The affinity of *C. cumbreana* is to *C. diversifolia* Jacq., as interpreted by Howard, (Journ. Arnold Arb. 30: 421–424. 1949; 40: 182, 195–196. 1959). He describes the ocrea as glabrous, while in *C. cumbreana* they are densely rufous-hirtellous at first and barbate at apex. In *C. cumbreana* the ocrea are glabrate with time, but some hairs persist above the leaf scar.

C. cumbreana may be the same as *C. lancifolia* Lundell, considered by Howard a synonym of *C. diversifolia.* Since differences in pubescence and ocreolae size are significant, and fine staminate and pistillate material of the proposed new taxon are available, I describe it rather than refer the collections with doubt to either *C. diversifolia* or *C. lancifolia.*

Coccoloba euvelutina Lundell, sp. nov. – Arbor; ramuli novelli dense pubescentes; folia velutina, supra glabrata, petiolata, petiolo velutino, 7–10 mm. longo; lamina chartacea, lanceolata vel oblongo-oblanceolata,

6.5–12.5 cm. longa, 2.5–5 cm. lata, apice breviter acuminata, basi cordata, nervis lateralibus 12–16-jugis, supra impressa, subbullata; inflorescentia racemosa, ad 23 cm. longa, hirtello-velutina; bracteae et ocreolae parvae; pedicelli fructiferi ad 1 mm. longi; fructu obovato, ca. 1 cm. longo, ad apicem late rotundato.

Tree, about 15 m. tall, 30 cm. diam., the branchlets rather slender, fulvous-pubescent; leaves subbullate, the lower surface velutinous, glabrate above except along the costa and primary veins, petiolate, the petioles arising close to base of the ocrea, 7–10 mm. long, velutinous, the ocrea less than 1 cm. long, strigose with long appressed hairs; leaf blades chartaceous, lanceolate or oblong-oblanceolate, 6.5–12.5 cm. long, 2.5–5 cm. wide, apex tapering to the short acumen, base rounded and cordate, the midvein elevated beneath, shallowly impressed and persistently pubescent above, the primary lateral veins conspicuous beneath, 12–16-pairs, ascending at a wide angle, shallowly impressed above, inconspicuously areolate; inflorescence racemose, not enlarged at nodes, angled, densely hirtellous, up to 23 cm. long; bracts and areolae hirtellous, usually about 0.5 mm. long, sometimes subequalling pedicels, thin; pedicels stout, about 1 mm. long; fruits obovate, about 1 cm. long, narrowed at base into a stipe, the perianth lobes about 1.8 mm. long, imbricate, crowning the broadly rounded or subtruncate apex.

Guatemala: Dept. Peten, La Cumbre, in *zapotal*, west of km. 142/143, about 500 m. from the road on top of hill, Sept. 9, 1975, *C. L. Lundell & Elias Contreras 19821* (LL, type) tree, 50 ft. high, 12 in. diam., "*uva.*"

The species appears to be related to *C. Liebmannii* Lindau, but differs markedly in its leaves. The pubescence of *C. euvelutina* is much denser and coarser, the leaves acuminate, subbullate, and distinctly cordate at base.

LEGUMINOSAE

Swartzia mayana Lundell, sp. nov. — Arbor; ramuli graciles, adpresse pubescentes; trifoliata, raro unifoliata; foliola coriacea, lanceolata, parva vel ad 2.8 cm. lata, 8.5 cm. longa, apice acuminata, emarginata, basi obtusa vel rotundata, glabrata, supra lucida, reticulato-venosa; inflorescentia laxa, racemosa, pauciflora, ad 7 cm. longa; pedicelli ad 2 cm. longi; alabastra subglobosa, glabra; calyx ad 1 cm. longus; petala flava, suborbicularis, ad 2 cm. longa et lata; stamina numerosa; ovarium stipitatum, glabrum.

Tree, up to 15 m. tall, 20 cm. diam., the branchlets slender, finely appressed pubescent, drying blackish; leaflets 1 or 3, rarely only 1, the leaf rachis and petiole narrowly winged, the wing 2–2.8 mm. wide at apex, tapering below, the petiole, rachis, petiolule, and base of leaflet all finely pubescent at first, glabrate; petioles 4–13 mm. long; petiolules thick, 0.5–15 mm. long; leaflets coriaceous, glossy above, lanceolate, widest at or near the middle, the lateral 2.5–5.5 cm. long, up to 1.8 cm. wide, the apical larger, up to 8.5 cm. long, 2.8 cm. wide, apex of leaflets attenuate, bluntly obtuse and emarginate, base narrowed and obtuse or rounded, sparsely pubescent along costa at first, otherwise glabrous,

finely veined and reticulate on both surfaces; racemes 2–5-flowered, up to 7 cm. long, sparsely pubescent at first, lax, the rachis and pedicels slender, the pedicels up to 2 cm. long; flower buds subglobose, glabrous, the calyx splitting irregularly into reflexed segments up to 1 cm. long; petal yellow, suborbicular, short-clawed, 1.3–2 cm. long, 1.4–2 cm. wide, glabrous; stamens numerous; ovary long-stipitate, glabrous.

Guatemala: Dept. Alta Verapaz, Rubelsanto, in high forest, *zapotal*, on top of hill, Balostrera, 2.3 km. S.E.E., July 23, 1975, *C. L. Lundell & Elias Contreras 19555* (LL, type), tree, 45 ft. high, 8 in. diam., petal bright yellow.

S. mayana, probably nearest *S. guatemalensis* (Donn. Sm.) Pittier among the Guatemalan taxa, usually has three leaflets, rarely one, with the wings of the rachis quite narrow, not over 2.8 mm. wide at top. The leaflets of *S. mayana* are small, bluntly acuminate, and emarginate at apex. Its petals are suborbicular, short-clawed, as wide as long.

RUTACEAE

Zanthoxylum durifoliolum Lundell, sp. nov. – Arbor, 15 m. alta., 30 cm. diam.; ramuli crassi, novelli minute puberuli; folia ad 30 cm. longa, glabra, 5- vel 7-foliolata, inermia; foliola petiolulata, petiolulo ad 1 cm. longo; lamina coriacea, subintegra, oblonga vel lanceolato-oblonga, 9.5–15 cm. longa, 3.5–5.5 cm. lata, apice breviter acuminata, acumine obtuso, basi rotundata et acuta; inflorescentia axillaris, paniculata, ad 15 cm. longa, 9 cm. lata, dense puberula; alabastra puberula; sepala 4 vel 5, ovata, imbricata, puberula; fructus longe stipitatus, puberulus, rugosus.

Tree, the branchlets thick, drying black, minutely puberulent at first, glabrate; leaves large, glabrous, up to 30 cm. long, with stout petioles up to 9 cm. long, unarmed; leaflets 5 or 7, petiolulate, drying with yellowish hue, the petiolules of lateral leaflets up to 1 cm. long, those of terminal leaflets 1.3–2 cm. long, the blades finely veined with prominent midrib elevated beneath, coriaceous, subentire, oblong or lanceolate-oblong, 9.5–15 cm. long, 3.5–5.5 cm. wide, apex short acuminate, often abruptly so, the acumen broad, obtuse, the blade sometimes rounded and deeply emarginate, base subcuneate or rounded and acute, the lateral leaflets inaequilateral at base; inflorescence axillary, paniculate, up to 15 cm. long with peduncles up to 6 cm. long, blackish, persistently puberulent; buds puberulent; sepals 4 or 5, ovate, imbricate, puberulent; follicles rugose, puberulent, stipitate, the stipes stout, 4–6 mm. long; seeds black, glossy, fully 5 mm. long.

Mexico: Chiapas, Mt. Ovando, December, 1937, *Eizi Matuda 2078* (LL, type), tree, 15 m. high, 30 cm. diam.; Mt. Ovando, alt. 2000 m., Nov. 14–18, 1939, *Matuda 3921* (LL), tree, 10 m. high, 30 cm. diam.

These collections, referred originally to *Z. melanostictum* Schlecht. & Cham., have been an enigma since I first studied them in 1938. A comparison with the type photograph is inconclusive, but shows smaller leaves with leaflets with acute short acumen in *Z. melanostictum*. A relationship to *Z. Kellermanii* P. Wilson is probable.

The large leaves with 5 or 7 firmly coriaceous subentire leaflets, large paniculate and persistently puberulent inflorescences borne in leaf axils, 4 or 5 puberulent sepals, and stipes subequalling the rugose, puberulent capsules are features to be noted in the Mt. Ovando taxon.

Zanthoxylum paucijugum Lundell, sp. nov. — Arbor; ramuli crassi, apice minute et parce puberuli; folia glabra, paucijuga, petiolata, petiolo 2–4 cm. longo; foliola 2, 3, 4 vel 5, rigide coriacea, petiolata; lamina crenata, oblongo-elliptica, anguste elliptica vel oblanceolata, ad 12 cm. longa, 4.5 cm. lata, apice obtusa, acuta vel abrupte apiculata, basi acuta, reticulata; inflorescentia parce puberula, paniculata, multiflora, ad 8 cm. longa; flores masculi 5-meri, raro 6- vel 7-meri; pedicelli crassi, 2–3 mm. longi; sepala glandulosa, ovata, 1–1.2 mm. longa; petala inflexa, anguste elliptica vel lanceolata, 2.5–3 mm. longa, apice glandulosa; stamina exserta; filamenta ca. 4 mm. longa; antherae ovato-cordatae, ad 2 mm. longae, nigropunctatae; carpela 5, glabra.

Tree, about 20 m. high, 30 cm. diam., the branchlets thick, drying black, obscurely and minutely puberulent at first; leaves glabrous with 2, 3, 4 or 5 leaflets; petioles 2–4 cm. long; leaflets with petiolules 2–8 mm. long, canaliculate and flattened above, the blades rigidly coriaceous, equal or unequal at base, oblong-elliptic, narrowly elliptic or oblanceolate, 4–12 cm. long, 2–4.5 cm. wide, apex rounded and abruptly obtuse, acute or apiculate, base acute, margin crenate, the midvein elevated beneath, shallowly impressed above, the primary lateral veins very slender, rather obscure, mostly 8–10 pairs, anastomosing, equally evident on both surfaces, reticulate on both surfaces; inflorescence rather sparsely puberulent, paniculate, in upper axils of leaves and terminal, up to 8 cm. long, spreading, multiflowered; staminate flowers glabrous, usually 5-parted, rarely 6- or 7-parted, the pedicels short, stout, 2–3 mm. long; sepals fleshy, ovate, 1–1.2 mm. long, the margin erose, with a large rounded medial translucent gland; petals fleshy, narrowly elliptic or lanceolate, 2.5–3 mm. long, inflexed apically, with large subapical gland, the apex rounded and minutely apiculate; stamens exserted; filaments stout, about 4 mm. long; anthers ovate-cordate, 1.8–2 mm. long, acutish, with conspicuous rounded dorsal gland; ovary usually with 5 carpels, glabrous.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, on top of hill, north on old road, in clearing, June 14, 1975, *C. L. Lundell & Elias Contreras 19457* (LL, type), tree, 60 ft. high, 12 in. diam., corolla green.

Z. paucijugum differs, according to description, from *Z. melanostictum* Schlecht. & Cham. of Mexico, but the two probably are related. The conspicuous large pellucid gland on each sepal, subapical on each petal, and dorsal on each anther is an unusual feature. The few rigidly coriaceous crenate leaflets are rather conspicuously reticulate on both surfaces.

EUPHORBIACEAE

Sebastiania leptopoda Lundell, sp. nov. — Arbor; ramuli novelli adpresse puberuli; folia glabra, petiolata, petiolo 6–18 mm. longo; lamina chartacea, oblanceolata, ad 16.5 cm. longa, 5.6 cm. lata, apice acuminata

vel subabrupte caudata, basi cuneata; inflorescentia axillaris, minute puberula; capsula 1–3, minute tomentella, longipedicellata; pedicelli ad 2.8 cm. longi; capsula 3-lobata, subglobosa, ad 1.7 cm. diam.; stylus crassus, ad 4 mm. longus; stigma 3-lobata, lobis recurvatis.

Tree, about 12 m. tall, 25 cm. diam., the branchlets mostly rather slender, at first pubescent at apex with minute appressed hairs, glabrate; leaves glabrous, paler beneath, petiolate, the petioles 6–18 mm. long, canaliculate; leaf blades firmly chartaceous, oblanceolate, 8–16.5 cm. long, 2–5.6 cm. wide, apex acuminate or subabruptly cuspidate, base cuneate, with a patelliform gland on each side above base, the margin crenulate-serrulate, the teeth often with small patelliform glands scattered entire length of blade, midvein rather slender, elevated beneath and above base on upper surface, primary lateral veins 9–13 pairs, slender but conspicuous on both surfaces, elevated beneath, ascending at wide angle, arcuate past middle and anastomosing, the reticulation open; inflorescence axillary, androgynous, spicate, sometimes branched at base, finely puberulent; infructescence with only 1 to 3 rather remote fruits; pedicels elongate, rigid, up to 2.8 cm. long; capsules depressed-globose, up to 1.7 cm. in diam., the three lobes rounded, deeply grooved between lobes, minutely tomentellous at first, crowned by the stout persistent elongated style, the style up to 4 mm. long, the stigma with three large recurved lobes.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, northwest of km. 159 of road, June 12, 1975, *C. L. Lundell & Elias Contreras 19439* (LL, type), tree, 35 ft. tall, 10 in. diam.

S. leptopoda appears to be very near *S. Tuerckheimiana* (Pax & Hoffm.) Lundell and *S. pubiflora* Lundell, all still inadequately known. The relationships of the taxa described in this complex from the mountains of Alta Verapaz and Baja Verapaz remain to be worked out.

The elongated fruiting pedicels of *S. leptopoda*, up to 2.8 cm. long, are exceptional in the genus.

FLACOURTIACEAE

Casearia mayana Lundell, sp. nov. – Frutex; ramuli pubescentes; folia petiolata, petiolo 4–5 mm. longo, raro ad 9 mm.; lamina membranacea, obovata, ad 16 cm. longa, 7 cm. lata, apice abrupte acuminata, basi acuta, minute crenato-serrulata; flores fasciculati; pedicelli puberuli, ad 1 cm. longi; sepala 5, 8–9 mm. longa, extus minute puberula; stamina 10; filamenta glabra; staminodia pilosa; ovarium pilosum; capsula glabrata, ellipsoidea, ad 3.5 cm. longa; semina numerosa, alba, arillata.

Shrub, up to 3 m. tall, the branchlets slender, lenticellate, short pilose at first; leaves dark green, thin, membranaceous, glabrous except for a few hairs on the petiole and along the midvein on both surfaces, petiolate, the petioles slender, canaliculate, usually only 4–5 mm. long, sometimes up to 9 mm. long; leaf blades obovate or oblanceolate, 6–16 cm. long, 2.5–7 cm. wide, apex abruptly acuminate, the acumen up to 1.5 cm. long, base acute, the margin obscurely crenate-serrulate, the teeth appressed, the midvein prominent beneath, sulcate and with a slender elevated ridge, the primary lateral veins 5- or 6-pairs, slender, the basal subtriplinerved,

the upper widely and arcuately ascending, anastomosing, conspicuous beneath, less so above, the venation openly reticulate on both surfaces; flowers numerous, fasciculate, the fascicles usually sessile, the basal bracts thin, white, ovate-oblong, up to 2 mm. long; pedicels slender, jointed below the middle, densely puberulent, up to 1 cm. long; sepals 5, free to base, greenish-white, narrowly oblong-elliptic, 8–9 mm. long, up to 4 mm. wide, apex obtuse-rounded, minutely puberulent and ciliolate, glabrous within; stamens 10; filaments stout, glabrous, 5 mm. long; anthers oblong, about 1.4 mm. long; staminodia slender, pilose, about 3 mm. long; ovary and base of style pilose; stigma capitate; fruit glabrate, ellipsoid, up to 3.5 cm. long, the seed numerous, about 8 mm. long, white, arillate.

Guatemala: Dept. Izabal, El Estor, in high forest, *corozal*, bordering Rio Sarco, on Rancho El Melagro, May 21, 1975, *C. L. Lundell & Elias Contreras 19325* (LL, type), shrub, 10 ft. high, flowers greenish-white; same locality, *Lundell & Contreras 19320* (LL), *19328* (LL), shrub, 4–5 ft. high, flowers greenish-white, fruit green (immature).

A remarkably distinct species, the shrub appears to be related to *C. Bartlettii* Lundell, differing in its few-veined obovate leaves, flowers with 5 sepals and 10 stamens, and smooth capsules, not ridged or winged.

MYRTACEAE

Eugenia bajaverapazana Lundell, sp. nov. — Arbor glabra, ad 13 m. alta, ramulis crassiusculis; folia coriacea, glabra, petiolata, petiolo crasso, canaliculato, 4–6 mm. longo; lamina sublucida, ovato-elliptica vel elliptica, 6–13 cm. longa, 3.5–5.5 cm. lata, apice acuminata, acumine late obtuso, basi rotundata, costa supra impressa, nervis lateralibus 11–13-jugis; inflorescentia axillaris, glabra, racemosa, parvissima, 2–6-flora; pedicelli crassi, 1–1.2 mm. longi; bracteolis persistentibus, ca. 0.4 mm. longis; calycis lobis late ovatis, 1–1.1 mm. longis, apice rotundatis, minute ciliolatis; petala alba, cucullata, ca. 5 mm. lata et longa; stamina numerosa; disco ca. 2.7 mm. diam.; ovula numerosa.

Tree, about 13 m. tall, entirely glabrous except for obscurely puberulent apical buds, the terminal branchlets rigid, rather stout at maturity; leaves firmly coriaceous, glabrous, petiolate, the petioles thick, canaliculate, 4–6 mm. long, drying dark red; leaf blades ovate-elliptic or elliptic, 6–13 cm. long, 3.5–5.5 cm. wide, apex subabruptly but broadly acuminate, the acumen bluntly obtuse, base rounded and slightly decurrent on petiole, the midvein prominently elevated beneath, sharply depressed above without lateral ridges, primary lateral veins very slender, nearly straight, spreading at a wide angle, anastomosing into a submarginal vein, the primary lateral veins 11–13-pairs with intermediaries, the veins rather obscure above, both surfaces minutely gland-dotted, sublucid above and dark green, paler beneath; inflorescences axillary or at defoliated nodes, glabrous, racemose, the rachis glabrous, very short, 1–5 mm. long, stout, with 2 to 6 decussately opposite flowers; pedicels glabrous, very short, stout, 1–1.2 mm. long; hypanthium glabrous, very small, campanulate, 1–1.2 mm. long; bracteoles at base minute, indurate, persistent, ovate-deltoid, about 0.4 mm. long, entirely free with wide space between bases

of each; sepals 4, united at base, thick, subequal, widely ovate-rounded, 1–1.1 mm. long, obscurely ciliolate at apex; petals white, glabrous, suborbicular, cucullate, about 5 mm. wide; stamens numerous; disk glabrous, about 2.7 mm. in diam.; style stout, glabrous, up to 7 mm. long; ovules numerous.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, on top of hill, east of km. 154, June 7, 1975, *C. L. Lundell & Elias Contreras 19383* (LL, type), tree, 40 ft. high, 5 in. diam., flowers white, "*guayabillo.*"

"*Guayabillo*" is the name used widely for species of *Eugenia* with edible fruits, while "*chilonche*" supposedly includes ones with inedible fruits.

The taxon has small axillary racemes with short pedicels, and with hypanthium and calyx scarcely more than 3 mm. long. It resembles *E. verapazensis* Lundell in some aspects, and appears related to that taxon.

SAPOTACEAE

Achras Chicle Pittier, Journ. Wash. Acad. Sci. 9: 436. 1919. *Manilkara Chicle* (Pittier) Gilly, Trop. Woods 73: 14. 1943.

British Honduras: Stann Creek District, Stann Creek Valley, Baboon Ridge, in high ridge on hilltop, Feb. 2, 1940, *Percy H. Gentle 3186* (LL), tree, 10 in. diam., "*sapodilla macho*"; in high ridge, hummock, between Silkgrass and Sapon Road, Jan. 20, 1954, *Gentle 8105* (LL), tree, 8 in. diam. Toledo District, in cohune ridge, near creek, near San Antonio, Dec. 12, 1945, *Gentle 5459* (LL), tree, 10 in. diam., "*sapote colorado.*"

Guatemala: Dept. Izabal, Vega Grande, near Los Amates, May, 1919, *H. Pittier 8537* (US, type); vicinity Lago Izabal, 2–5 km. south of Izabal, in forest, 20–200 m. elev., April 24, 1966, *Gayle C. Jones, George R. Proctor & Lyndon Facey 3062* (LL), tree, 35 m., d.b.h. 75 cm., hartwood rich mahogany red, "*chicle.*" Dept. Peten, Cadenas, bordering Rio Gracias, in clearing on Ramirito Ranch, west of Poptun Road, about 2.5 km. from village, Feb. 22, 1975, *C. L. Lundell & Elias Contreras 19035* (LL), tree, 50 ft. high, 12 in. diam., fruit brownish, "*chiquibul,*" "*oreja de burro*"; Cadenas, bordering Rio Gracias, in clearing on river bank, bordering the village, west, Feb. 22, 1975, *Lundell & Contreras 19036* (LL), tree, 90 ft. high, 30 in. diam., flowers creamish-white, "*oreja de mico,*" "*chiquibul*"; La Cumbre, Los Caños, in *zapotal*, east of km. 142 of the Peten-Izabal Road, Mar. 10, 1975, *Lundell & Contreras 19075* (LL), tree, 150 ft. high, 40 in. diam., young fruit brownish, "*chiquibul,*" "*chico zapote,*" "*chicle de segunda*"; La Cumbre, in high forest, *zapotal*, east of km. 141, May 30, 1975, *Lundell & Contreras 19373* (LL), tree, 150 ft. high, 30 in. diam., flowers white; La Cumbre, in high forest, *zapotal*, on top of hill, west of km. 142 of road, May 30, 1975, *Lundell & Contreras 19379* (LL), tree, 90 ft. high, 25 in. diam., flowers white, "*chiquibul.*"

These are representative collections of the species showing the variation in leaf form, flower size, and differences in seeds. There is a correlation between narrow oblanceolate leaves dull above, small flowers, and seed-scars up to one-half the length of the ventral margin, the linear seed-scars sometimes as long as 1.2 cm. Whether or not these differences are material awaits further study.

The common form of *A. Chicle* has larger obovate, elliptic or oblong leaves, larger flowers, and seed-scars not over 7.5 mm. long, about one-third the length of the ventral margin.

Like *Manilkariopsis staminodella* (Gilly) Lundell, also called "*chiquibul*," *A. Chicle* is a source of the inferior chicle gum produced in the rain forest south of Lake Peten Itza and the Belize River.

Bumelia Ibarrae Lundell, sp. nov. — Arbor; ramuli crassi, dense rufo-tomentosi; folia petiolata, petiolo rufo-tomentoso, 1.4–3 cm. longo; lamina subcoriacea, rufo-tomentosa, elliptica vel obovato-elliptica, ad 18 cm. longa, 10 cm. lata, apice rotundata, abrupte acute apiculata vel subacuminata, basi subcuneata, nervis 8–10-jugis; flores fasciculati, dense rufo-tomentosi, pedicellati; alabastra ad 8 mm. longa; sepala 5, ovato-rotundata, exteriora ca. 6 mm. longa, extus rufo-pubescentia, intus glabra; gamopetala; corolla glabra, lobis 5, lobis 3-lobatis; staminodia 5, petaloidea; stamina 5; ovarium glabrum, 5-loculare.

Tree, about 20 m. tall, 36 cm. diam., the branchlets stout, densely and conspicuously rufous-tomentose; leaves large, petiolate, the petioles thick, rufous-tomentose, 1.4–3 cm. long, canaliculate; leaf blades firm, subcoriaceous, rufous-pubescent beneath, densely so along midvein and primary veins, glabrate above except along veins, elliptic or obovate-elliptic, 10.5–18 cm. long., 5.6–10 cm. wide, apex rounded and abruptly and acutely apiculate, the acumen not over 5 mm. long, base subcuneate, acute, the midvein broad and prominent beneath, sulcate above, the primary lateral veins 8–10 pairs, rather acutely ascending and prominent beneath, comparatively inconspicuous above; flowers large, fasciculate in leaf axils or at upper defoliated nodes, crowded, densely rufous-tomentose; pedicels short, sometimes up to 7 mm. long, stout; buds ellipsoid, up to 8 mm. long; sepals 5, ovate-rounded, the outer 5–6 mm. long, the inner thinner, rufous-sericeous on outer surface, glabrous within; gamopetalous; corolla 9–10 mm. long, glabrous; tube campanulate, 3–3.5 mm. long; 5-lobed, the lobes 3-lobed to middle, the central lobe elliptic, 3–3.5 mm. long, the lateral lobes obliquely ovate, filiform-acuminate, shorter than central lobe; staminodia 5, petaloid, thin, ovate, up to 5.5 mm. long, laciniate; stamens 5; filaments inserted at apex of corolla tube, stout, up to 5.5 mm. long; anthers versatile, large, subsagittate, 2.6–3 mm. long; ovary greenish, glabrous, 5-loculate; the style glabrous, tapering to the punctiform stigma; fruits (very immature) obovoid, up to 3.5 cm. long, apiculate.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, west of km. 159 of road, Aug. 12, 1975, *C. L. Lundell & Elias Contreras 19619* (LL, type), tree 50 ft. high, 12 in. diam., flowers white; same locality, June 14, 1975, *Lundell & Contreras 19453* (LL); August, *19617* (LL), *19639* (LL); same locality, west of km. 161/162, *Lundell & Contreras 19699* (LL), *19703* (LL); "*zapote faisan.*"

Superficially resembling *Bumelia Stevensonii* (Standl.) Stearn, to which it is obviously related, it differs in its apiculate or subacuminate leaves, subcuneate at base, and 8–10 pairs of primary lateral veins. The rufous

Fig. 9. The sapodilla, *Achras Zapota* L., nursery planted in September, 1928 at Honey Camp. C. L. Lundell standing beside a year old seedling, September, 1929. Although a hardwood the tree grows rapidly.

Fig. 10. Experimental tapping of *Achras Zapota* L. at Honey Camp using the herring-bone system. Note quart size paper container at base of tree into which the latex flows. My assistant, Modesto Castillo, is the chiclero.

Fig. 11. The system used in commercial tapping of *Achras Zapota* L. Note the canvas bag at base of tree used by all chicleros for collecting and transporting the latex.

pubescence of *B. Ibarrae* is considerably coarser than the indument of *B. Stevensonii*. The flowers are fully twice as large, with outer sepals up to 6 mm. long.

The species is dedicated to Sr. Jorge A. Ibarra, distinguished Director of the Museo Nacional de Historia Natural of Guatemala, who has facilitated my field work in Guatemala since 1959.

Manilkariopsis (Gilly) Lundell, gen. nov. *Manilkara*, subgenus *Manilkariopsis* Gilly, Trop. Woods 73: 9. 1943.

Type species: *Manilkariopsis tabogaensis* (Gilly) Lundell (= *Manilkara tabogaensis* Gilly).

Manilkariopsis meridionalis (Gilly) Lundell, comb. nov. *Manilkara meridionalis* Gilly, Trop. Woods 73: 12. 1943. *Achras meridionalis* (Gilly) Lundell, Phytologia 16: 446. 1968.

Manilkariopsis petenensis Lundell, sp. nov. — Arbor; ramuli crassiusculi, novelli tomentosi; folia novella subtus tomentosa, glabrata, longe petiolata, petiolo 2–4 cm. longo; lamina coriacea, oblonga, oblongo-elliptica vel oblanceolata, ad 12.5 cm. longa, 5.5 cm. lata, apice obtusa vel rotundata, minute emarginata, basi acuta; flores solitarii, axillares; pedicelli ad 2 cm. longi; sepala 6, biseriata, ad 9 mm. longa et lata, exteriora late ovata, interiora elliptica; gamopetala; corolla 1–1.1 cm. longa, glabra, tubus 5–6 mm. longus, lobis 3-lobatis; staminodia petaloidea, oblanceolata, ca. 4 mm. longa, glabra, erosa; stamina 2.5–3 mm. longa; ovarium 11-loculare; stylus crassus, ca. 6 mm. longus; stigma minute lobata; fructus ovoideus, ca. 5 cm. longus et latus; semina oblongo-obovoidea, ca. 2 cm. longa, apice rotundata, basi acuta.

Tree, up to 45 m. tall, 1.3 m. diam.; branchlets rather thick, tomentose at first with brownish appressed hairs, glabrate; leaves brownish tomentose on lower surface at first, glabrous above except along the midvein, glabrate, the petioles elongate, slender, canaliculate, 2–4 cm. long; leaf blades coriaceous, oblong, oblong-elliptic or oblanceolate, 7–12.5 cm. long, 2.5–5.5 cm. wide, apex broadly obtuse to rounded, inconspicuously emarginate, base acute, midvein elevated beneath, slightly impressed above and with a narrow elevated ridge in center, the primary lateral veins very slender, parallel, obscure on both surfaces; flowers axillary, solitary; pedicels brown-tomentose, slender in flower, thick in fruit, up to 2 cm. long in flower; sepals 6, biseriate, the outer coriaceous, tomentose with brown appressed hairs externally, obscurely sericeous within, broadly ovate, up to 9 mm. long, up to 9 mm. wide at base, obtuse at apex, the inner sepals thinner, finely sericeous, nearly glabrous, elliptic, up to 9 mm. long, 7 mm. wide, rounded at apex; gamopetalous; corolla glabrous, 1–1.1 cm. long, the tube subcoriaceous, suburceolate, 5–6 mm. long, glabrous; corolla lobes 3-lobed, the lobes united to middle or above, the central lobe longer than lateral lobes, spatulate, fully 2 mm. long, rounded at apex and subentire, the lateral lobes obliquely lanceolate, shorter than central lobe, acute or erose, not overlapping in center; staminodia petaloid, glabrous, subcoriaceous, equalling lateral lobes of corolla lobes, oblanceolate, about 4 mm. long, united at base to lateral lobes of corolla lobes about 1 mm.,

Fig. 12. Latex is stored in the five-gallon oil tins. An iron kettle is used for the cooking of the latex to reduce moisture content until the gum coagulates.

Fig. 13. Upper left: the boiling latex is stirred continuously to prevent scorching.

Bottom: as the latex coagulates the gum is stirred and aerated to cool and consolidate the chicle.

Fig. 14. Upper left: molded blocks of chicle gum are spread on canvas to harden.

Bottom: blocks of chicle, about twenty pounds each, are stacked, awaiting transport by mule-back from the chiclero camp to the central station of the contractor.

the apex erose; stamens small (abortive?), 2.5–3 mm. long, glabrous; filaments deltoid, slender above, about 1 mm. long, inserted at apex of tube; anthers lanceolate, 1.5–2 mm. long, apiculate; ovary pubescent, style glabrous, thick, about 6 mm. long; stigma with short finger-like recurved lobes; ovary 11-loculate, the ovules solitary, attached at base; fruits ovoid, about 5 cm. long and wide, brown, scurfy; seed dark brown, shiny, oblong-obovoid, about 2 cm. long, 5 mm. thick, broadly rounded at apex, acutish at base, with minute dorsal fold; seed-scar basilateral, linear, about 11 mm. long, 1 mm. wide, extending to within 2 mm. of base.

Guatemala: Dept. Peten, in *zapotal*, km. 48/49 of the Flores-Tikal Road, March 19, 1975, *C. L. Lundell & Elias Contreras 19130* (LL, type), tree, 150 ft. high, 48 in. diam., flowers white, fruit brownish, "*chico zapote.*"

A remarkably well-marked species, *M. petenensis* apparently has affinity to *M. Rojasii* (Gilly) Lundell and *M. meridionalis* (Gilly) Lundell, differing from both in its petioles fully twice as long, larger sepals and corolla, and with petaloid staminodia up to 4 mm. long united with lateral lobes of corolla lobes about 1 mm. at base. If the union at base of the staminodia is of importance, then *M. Rojasii* is closely related.

M. petenensis has a stigma with minute finger-like recurved lobes, and oblong-obovoid seed with basilateral linear seed-scar fully half the length of seed. The distinctive seed is rounded above, acutish at base with minute dorsal fold.

Manilkariopsis Rojasii (Gilly) Lundell, comb. nov. *Manilkara Rojasii* Gilly, Trop. Woods 73: 11. 1943. *Achras Rojasii* (Gilly) Lundell, Phytologia 16: 446. 1968.

Manilkariopsis staminodella (Gilly) Lundell, comb. nov. *Manilkara staminodella* Gilly, Trop. Woods 73: 10. 1943. *Achras staminodella* (Gilly) Lundell, Phytologia 16: 446. 1968.

Tree, up to 40 m. tall, 45 cm. diam.; branchlets rather stout, pubescent apically at first with reddish-brown appressed hairs, glabrate early, blackish and covered with a shiny varnish-like exudate; leaves crowded at apex of branchlets, petiolate, the petioles slender, canaliculate, 1.2–2.8 cm. long, drying blackish, with scattered appressed reddish hairs; leaf blades chartaceous or subcoriaceous, lanceolate, elliptic-lanceolate or oblanceolate, 5–12 cm. long, 2.5–5.5 cm. wide, apex subacuminate, acutish or obtusish, base rounded and acutish, midvein slender and elevated beneath, sparsely pubescent with appressed reddish hairs, sharply impressed above with narrow central ridge toward base, the blade otherwise glabrous, the lateral veins numerous, very slender, nearly parallel, rather obscure on both surfaces, faintly reticulate; flowers solitary in the leaf axils below, short racemose apically with the pedicels subtended by small bract; pedicels rather stout, mostly curved, 1–1.3 cm. long, densely pubescent with brownish appressed hairs; calyx with 6 sepals, rarely 4 or 8, the sepals imbricate, coriaceous, tomentulose, the outer broadly ovate, up to 1 cm. long, 8 mm. wide at base, acutish, the inner ovate-elliptic or oblanceolate-oblong, thinner, up to 8 mm. long, 6 mm. wide; gamopetalous, the cylindric tube 3–4.5 mm. long, pubescent below the

sinuses of the lobes externally, the 6 lobes ovate, imbricate, 6–8 mm. long, 3-lobate up to 2/3 of length, the lobes subequal, the central lobe spatulate, up to 1 mm. wide above, the lateral lobes obliquely ovate-elliptic or lanceolate, up to 3.5 mm. wide, overlapping above middle, apex erose, all of same texture, glabrous; staminodia 6, free, fleshy, up to 2.5 mm. wide, 1.5 mm. long, strongly inflexed (like folded hand), pubescent externally, glabrous within, the apex subtruncate, erose to lacerate, inserted at apex of tube; stamens opposite corolla lobes, about 3.5 mm. long; filaments pubescent, deltoid at base, short or up to 1.5 mm. long, inserted at apex of tube; anthers lanceolate with apex apiculate or attenuate-apiculate, pubescent on dorsal surface; ovary pubescent, depressed, 8–11-loculate; style thick, glabrous; fruits ovoid, small, brownish, scurfy, about 2.5 cm. long; seed ellipsoid, compressed, almost 2 cm. long, acutish at base, with seed-scar linear, 1.1 cm. long, up to 1.5 mm. in width.

British Honduras: Toledo District (?), Camp 33, B. H. – Guatemala boundary survey, 2850 ft. alt., April 29, 1934, *W. A. Schipp 1310* (F, LL, MICH, isotypes), tree, 100 ft., 3 ft. diam., flowers creamy-white, fruits brown and vary in size from mere marbles to that of average sized hen eggs; common tree inland. El Cayo District, Chiquibul Forest Reserve, 2.2 miles southeast of Holec Camp, in high forest, 1600–1700 ft., April 25, 1969, *George R. Proctor 30107* (LL), tree, 40 m. tall, flowers cream, "*chiquibul.*"

Guatemala: Dept. Peten, La Cumbre, in *zapotal*, on top of hill, east of the village, March 16, 1975, *C. L. Lundell & Elias Contreras 19107* (LL), tree, 125 ft. high, 35 in. diam., flowers white, fruit brownish, "*chiquibul.*" Dept. Izabal, in high forest, *zapotal*, east of km. 181 of the Izabal-Peten Road, March 17, 1975, *Lundell & Contreras 19112* (LL), tree, 70 ft. high, 30 in. diam., flowers white, "*chiquibul,*" "*zapote oreja de mico*"; Cadenas (Puerto Mendez), on Caserio Semox, km. 193 of the Peten-Guatemala Road, in high forest, *zapotal*, April 5, 1975, *Lundell & Contreras 19140* (LL), *19142* (LL), tree up to 80 ft. high, 20 in. diam., "*chiquibul,*" "*chicle de segunda.*" Dept. Alta Verapaz, Rubelsanto, in high forest, *zapotal*, on top of hill, about 2.3 km. S.E.E., July 20, 1975, *Lundell & Contreras 19538* (LL), *19540* (LL), *19542* (LL); same locality, July 23, 1975, *19557* (LL), "*chiquibul,*" "*chicle de segunda.*"

The peculiar nature of the inflexed fleshy staminodia sets *M. staminodella* apart from all other species of the genus.

With complete flowering and fruiting material now available, the taxon is redescribed, for the rather brief original description is inadequate. The type collection, *Schipp 1310*, has corolla lobes with lanceolate lateral lobes and smaller leaves, but agrees in essential features with *Proctor 30107* and the recent collections from Guatemala. The pedicels, especially those of the fruits, are prominently lenticellate, and this characteristic together with the long slender petioles and leaf blades mostly less than 10 cm. in length are useful in the recognition of fruiting specimens. *Achras Chicle* Pittier, which grows in the same area with *M. staminodella*, has lenticellate pedicels, but its large thick leaves are altogether different from those of this taxon and *Achras Zapota* L.

M. staminodella is probably the chief source of the inferior chicle called "*chiquibul*" and "*chicle de segunda*." Field observations indicate that the population of the tree is greater than that of *Achras Chicle*, the principal other source of the inferior gum, which is produced in the area south of Lake Peten Itza and the Belize River. *M. petenensis* and *M. striata* are tapped, also, but little is known about their importance as sources of gum.

Manilkariopsis striata (Gilly) Lundell, comb. nov. *Manilkara striata* Gilly, Trop. Woods 73: 11. 1943. *Achras striata* (Gilly) Lundell, Phytologia 16: 446. 1968.

Manilkariopsis tabogaensis (Gilly) Lundell, comb. nov. *Manilkara tabogaensis* Gilly, Trop. Woods 73: 10. 1943. *Achras tabogaensis* (Gilly) Lundell, Phytologia 16: 446. 1968.

Mastichodendron eucoriaceum Lundell, sp. nov. — Arbor; ramuli crassiusculi, novelli rufo-sericei; folia novella rufo-sericea, supra glabrata, petiolata, petiolo canaliculato, 7–18 mm. longo; lamina rigide coriacea, elliptica vel obovato-elliptica, ad 13 cm. longa, 5.5 cm. lata, apice rotundata, basi acutiuscula, crassinervia; flores fasciculati; pedicelli rufo-sericei, 4–7 mm. longi; sepala 5, imbricata, coriacea, late ovata, ad 2 mm. longa, 2.5 mm. lata, apice rotundata, extus parce rufo-sericea; gamopetala; corolla glabra, lobis 5, late ellipticis; staminodia 5, lanceolata, acuminata, erosa; stamina 5, glabra; ovarium glabrum, 5-loculare.

Tree, about 15 m. tall, 20 cm. diam., the branchlets stout, rufous-sericeous at first; leaves in bud rufous-sericeous, glabrate above but persistently sericeous on lower surface giving the blade a reddish hue beneath, rather rigidly petiolate, the petioles canaliculate, 7–18 mm. long, rufous-sericeous at first; leaf blades rigidly coriaceous, elliptic or obovate-elliptic, 6–13 cm. long, 3–5.5 cm. wide, apex rounded, base acutish, the midvein elevated beneath, sulcate above, the primary lateral veins prominent beneath, slightly impressed above, 11–14-pairs, widely arcuately ascending; flowers mostly fasciculate on old wood; pedicels slender, rufous-sericeous, 4–7 mm. long; sepals 5, the outer thickly coriaceous, the inner thinner, broadly ovate-rounded, up to 2 mm. long, 2.5 mm. wide, tightly imbricate, rather sparsely rufous-sericeous; gamopetalous, with short tube; corolla greenish, glabrous, exserted above calyx, the lobes 5, broadly elliptic, entire; staminodia 5, lanceolate, thin, acuminate, erose margined; stamens 5, short, glabrous; ovary glabrous, 5-loculate, tapering into style.

Guatemala: Dept. Baja Verapaz, Union Barrios, clearing west of km. 153/154, 1 km. from the village, Aug. 28, 1975, *C. L. Lundell & Elias Contreras 19740* (LL, type), tree, 50 ft. high, 8 in. diam.

The relationship of *M. eucoriaceum* appears to be with *M. belizense* (Lundell) Cronquist, differing in its larger rigidly coriaceous leaves persistently rufous-sericeous beneath, and rounded rather than acute or subacuminate at apex. *M. belizense* has a much larger corolla thickened in throat.

Better flowering material and fruit of both *M. parviflorum* and *M. cucoriaceum* are needed to establish relationships. Although the staminodia in each of these new taxa are at least subpetaloid, the species are referred to *Mastichodendron* rather than *Bumelia* where some species have entire corolla lobes as in this genus.

Mastichodendron parviflorum Lundell, sp. nov. – Arbor, 15 m. alta, 25 cm. diam.; ramuli novelli adpresse rufo-pubescentes; folia parva, glabrata, petiolata, petiolo 1.5–2.5 cm. longo; lamina coriacea, subintegra, lanceolata, ad 10.5 cm. longa, 3.2 cm. lata, apice acuminata, basi acutiuscula, nervis lateralibus 12–14-jugis; flores fasciculati, axillares; pedicelli ad 5 mm. longi, adpresse rufo-pubescentes; sepala 5, imbricata, exteriora adpresse rufo-pubescentia, late ovata, ca. 2.3 mm. longa, 3 mm. lata; gamopetala; corolla glabra, lobis 5, ovato-ellipticis; stamina 5; staminodia 5, subpetaloidea, lanceolata, erosa; ovarium glabrum, 5-loculare.

Tree, 15 m. tall, 45 cm. diam., branchlets slender, drying blackish, sericeous at first with reddish hairs; leaves small, glabrate, petiolate, the slender petioles canaliculate, sparsely and loosely sericeous, 1.5–2.5 cm. long; leaf blades coriaceous, paler beneath, lanceolate, 4–10.5 cm. long, 1.5–3.2 cm. wide, apex acuminate, base acutish, margin subentire and thickened, the midvein elevated beneath, shallowly impressed above, the primary lateral veins very slender, 12–14-pairs, nearly parallel at a wide angle, rather obscure beneath; flowers axillary, fasciculate, the pedicels up to 5 mm. long (in bud), slender, reddish pubescent with appressed hairs; sepals 5, imbricate, pubescent with appressed reddish hairs, broadly ovate, the outer (in bud) about 2.3 mm. long, 3 mm. wide, the inner greenish, thinner, less pubescent; gamopetalous; corolla glabrous, greenish, with tube shorter than the lobes (in bud), the corolla lobes ovate-elliptic, rounded at apex; stamens 5, opposite lobes, with short filaments, glabrous; staminodia 5, subpetaloid, thin, lanceolate, erose, shorter than stamens (in bud); ovary glabrous, 5-loculate; style short.

Guatemala: Dept. Peten, La Cumbre, in *zapotal,* 4 km. east on Purula River Road, on top of hill, Sept. 21, 1975, *C. L. Lundell & Elias Contreras 19908* (LL, type), tree, 50 ft. high, 8 in. diam., *"silion."*

With lanceolate leaves strikingly like those of the type of *Dipholis durifolia* Standl., the species is quite different in aspect from all others in the genus. Its petal-like staminodia are anomalous. The thickened margin of the leaf blade is subcrenulate but irregular. Only flower buds are available, so its relationship remains to be determined.

Pouteria laeteviridis (Pittier) Lundell, comb. nov. *Lucuma laeteviridis* Pittier, Contr. U. S. Nat. Herb. 20: 482. 1922.

Arborescent shrub or tree up to 20 m. high, 45 cm. diam.; branchlets rufous-pubescent at first with closely appressed minute hairs; leaves membranaceous (*Pittier 8534, Gentle 4551*), chartaceous (*Lundell & Contreras 19318*) or firmly coriaceous (*Lundell & Contreras 19347*), usually large, the petioles 1–4 cm. long, canaliculate, pubescent with very minute appressed reddish hairs; leaf blades obovate-elliptic, oblong or oblanceolate-oblong, 10–30 cm. long, 6–10 cm. wide, apex rather abruptly obtuse-acuminate, base cuneate or acute, decurrent on the petiole, the leaf buds and

tender leaves minutely rufous-sericeous on both surfaces, glabrate at maturity, entire, the midvein prominent, elevated beneath, sulcate and with narrow central ridge above, the primary veins 12–15 pairs, prominent beneath, subimpressed on upper surface, the membranaceous blades conspicuously reticulate-veined on both surfaces, the reticulation obscure in the coriaceous blades; flowers variable in size, usually large, usually several in the leaf axils or on defoliated branchlets; flowers (described from *Lundell & Contreras 19347*) with slender pedicels 1.5–2 cm. long, minutely appressed-pubescent with rufous hairs; sepals 6, imbricate, broadly ovate, unequal, 6–9 mm. long, the smaller outside, rounded at apex, minutely rufous-sericeous dorsally; corolla greenish, tubular, 10–12 mm. long, 6- or 7-lobed, the tube 6–7 mm. long, glabrous, the lobes erect, narrowly oblong, 3.5–5 mm. long, with rounded apex, margin minutely papillate, sparsely sericeous dorsally; staminodia 6 or 7, subulate, inserted in sinuses, equalling stamens, about 3 mm. long, minutely papillate; stamens 6 or 7, 3–4 mm. long, inserted below level of sinuses, the filaments subulate like the staminodia, the anthers basifixed, ovate-oblong, 2 mm. long; ovary 6- or 7-loculate, ribbed, tapering into the long stout style, tomentose; stigma subcapitellate; fruits (*Lundell & Contreras 19318*) glabrous, depressed-globose, up to 6 cm. in diam., 4 cm. high (approaching maturity); seed ellipsoid, up to 2.5 cm. long, 1.5 cm. wide, acute at apex, smooth, brown, shiny, strongly compressed ventrally, the seed-scar linear, up to 2 cm. long, 2.5–3 mm. wide.

Guatemala: Dept. Izabal, in forests at Las Playitas, May 18, 1919, *H. Pittier 8534* (F, leaf and flowers from U.S. type), tree 15 m., flowers yellowish-white; El Estor, on Rio Sause Road, clearing about 3 km. NEE, *C. L. Lundell & Elias Contreras 19347* (LL), arborescent shrub, 12 ft. high, 2 in. diam., flowers greenish, "*zapotillo.*" Dept. Alta Verapaz, Pansos, on La Planta Road, about 2 km. south, in clearing, May 20, 1975, *Lundell & Contreras 19318* (LL), tree, 50 ft. high, 12 in. diam., fruit brownish, "*zapotillo.*"

British Honduras: Toledo District, Bolo Camp, upper reach of Golden Stream, in high ridge, April 18, 1944, *Percy H. Gentle 4551* (LL), tree, 8 in. diam.

The species has been considered a synonym of *P. campechiana* (H.B.K.) Baehni by Baehni, Cronquist, L. Williams and others. The collection of fruits now makes possible its recognition as distinct. The linear seed-scar, up to 2 cm. long and 3 mm. wide, contrasts sharply with the large elliptic seed-scar of *P. campechiana* which is up to 2.5 cm. wide. Other features distinguishing *P. laeteviridis* from *P. campechiana* are its large leaves, long petioles, elongated pedicels and larger flowers, often twice as large with greenish corolla. The leaves of *P. laeteviridis* vary from membranaceous to firmly coriaceous, the venation being reticulate on both surfaces in the thinner-leaved form (like the type), rather obscure in the coriaceous-leaved form.

P. laeteviridis is represented in the Lundell Herbarium by a large series of collections from the rain forest of southern British Honduras and adjacent Guatemala (Peten, Izabal, Alta Verapaz).

Pouteria estoriensis Lundell, sp. nov. – Arbor; ramuli pubescentes; folia petiolata, subchartacea, oblongo-elliptica vel obovato-elliptica, ad 19 cm. longa, 6.5 cm. lata, apice acuminata, basi acuta; flores 4- vel 5-meri, axillares, fasciculati, pedicellati; sepala pubescentia; corolla ad 3 mm. longa, lobis auriculatis; stamina et staminodia parva; ovarium hirsutum, 2-loculare.

Tree, up to 20 m. tall, 45 cm. diam., branchlets rather stout, angled, densely pubescent at first with short closely appressed golden-brown dibrachiate hairs; leaves with slender canaliculate petioles 8–15 mm. long, the petioles pubescent with minute appressed dibrachiate hairs, drying darker than midvein; leaf blades thin, membranaceous or subchartaceous, slightly paler beneath, oblong-elliptic or obovate-elliptic, 7.5–19 cm. long, 3–6.5 cm. wide, apex subabruptly acuminate, the acumen obtusish, base acute, at first pubescent on both surfaces with minute appressed golden-brown dibrachiate hairs, glabrate, midvein elevated beneath, broadly sulcate above and often drying with a narrow central ridge, the primary lateral veins very slender, 11–15 pairs, almost equally evident on both surfaces, nearly straight, ascending at a wide angle; flowers (apparently staminate) usually 4-parted, sometimes 5-parted, axillary, fasciculate, or sometimes on short bracteate branchlets with flowers fasciculate at the nodes, and racemiform; pedicels slender, pubescent, 3.5–5 mm. long; sepals 4 or 5, suborbicular or broadly ovate, up to 2.4 mm. long, the inner larger, imbricate, minutely appressed pubescent on outer surface, apex rounded; corolla up to 3 mm. long, the lobes 4 or 5, exserted; corolla tube turbinate; corolla lobes ovate-deltoid, about 1 mm. long, auriculate, reflexed, minutely pubescent on outside medially with appressed hairs; staminodia 4 or 5 in sinuses of lobes, triangular-subulate, thickish, about 0.5 mm. long; stamens 4 or 5, attached slightly below apex of corolla tube, the filaments horizontal, curved, about 0.4 mm. long; anthers ovate-ellipsoid, about 0.5 mm. long; ovary flat, shallowly lobed, pubescent, 2-loculate, probably abortive; style stout, glabrous.

Guatemala: Dept. Izabal, El Estor, in high forest, bordering Lake Izabal, El Zapotillo east, May 19, 1975, *C. L. Lundell & Elias Contreras 19315* (LL, type), tree, 35 ft. high, 6 in. diam., flowers greenish-white; same locality and date, *Lundell & Contreras 19309* (LL).

P. estoriensis has affinity to *P. Lundellii* (Standl.) L. Wms.

Pouteria Mante Lundell, sp. nov. – Arbor, 5 m. alta, 30 cm. diam.; ramuli novelli adpresse pubescentes; folia petiolata, petiolo 1–2.5 cm. longo; lamina chartacea, supra glabra, subtus novella minute sericea, oblanceolata vel oblanceolato-elliptica, 7–21 cm. longa, ad 7.8 cm. lata, apice acutiuscula vel obtusa, basi acuta, nervis lateralibus 9–14-jugis; flores feminei virides, ad axillam fasciculati; pedicelli ad 8 mm. longi, adpresse pubescentes; sepala 5, coriacea, imbricata, late ovata, 5–6.5 mm. longa, extus adpresse pubescentia, intus glabra; corolla subturbinata vel subcylindrica, ca. 9 mm. longa; lobi imbricati, obovato-elliptici, ca. 4 mm. longi, extus parce strigosi, intus glabri, tubo ca. 5 mm. longo; stamina 5, abortiva, ca. 2.5 mm. longa; staminodia 5, penicellata, 2 mm. longa;

ovarium hirsutum, 5-loculare; bacca globosa, ad 8 cm. longa, 7 cm. lata; semen 2 vel 3, obovoideum, ad 4 cm. longum; area derasa late elliptica, ad 3.8 cm. longa, 1.7 cm. lata.

Tree, 5 m. high, 30 cm. diam., the branchlets rather thick, with leaves crowded at apex, densely pubescent with minute appressed brownish hairs; leaves with petioles 1–2.5 cm. long, the petioles rather slender, pubescent like the branchlets; leaf blades chartaceous, oblanceolate or oblanceolate-elliptic, 7–21 cm. long, 7.8 cm. wide, apex acutish or obtuse, base narrowed, acute, midvein elevated beneath, sulcate with slender raised rib in center above, the primary lateral veins 9–14-pairs, elevated beneath, finely reticulate on both surfaces; minutely sericeous on lower surface at first. *Pistillate flowers:* axillary, fasciculate, usually 2 in axil, the pedicels up to 8 mm. long, usually recurved, pubescent with minute brownish appressed hairs; sepals 5, the outer slightly smaller, imbricate, coriaceous, ovate-orbicular, 5–6.5 mm. long, rounded at apex, glabrous within, pubescent dorsally like the pedicels; gamopetalous, the tube of corolla subturbinate or subcylindric, about 5 mm. long, glabrous; the 5 lobes erect, imbricate, obovate-elliptic, about 4 mm. long, rounded at apex, sparsely strigose dorsally; stamens 5 (staminodia-like), alternate with the corolla lobes, inserted at top of tube, about 2.5 mm. long, the abortive anthers ovate-oblong, apiculate, very minutely puberulent; staminodia inserted below level of stamens, penicillate, fully 2 mm. long, shorter than stamens; ovary and base of style hirsute with erect hairs, the style thick, glabrous above; ovary 5-loculate, with 1 ovule in each locule; fruit globose (fide Hernandez), 8 cm. long, 7 cm. wide, slightly ribbed, 2- or 3-seeded, skin orange-yellow, flesh yellow, firm, edible; seed brownish, lustrous, obovoid, up to 4 cm. long, acutish at apex; seed-scar large, elliptic, basilateral, about 3.8 cm. long, 1.7 cm. wide, covering fully a third of surface of seed.

Mexico: Varacruz, Tuxpam, May 19, 1945, *Efraim Hernandez X. 693* (LL, type), cultivated tree, fruits with orange-yellow skin, flesh yellow, firm and edible, called "*mante.*"

This cultivated fruit tree, apparently related to *P. laeteviridis* (Pittier) Lundell, differs from that tree in having slightly ribbed fruits, 2- or 3-seeded, the seed lustrous-brown, up to 4 cm. long, 2.5 cm. in diameter, and with large elliptic seed-scar covering nearly the full length of seed, and 1.7 cm. wide. The fruits of *P. laeteviridis* are 6- or 7-seeded, with ventrally compressed seed having linear seed-scar only 2.5–3 mm. wide. The flowers of *P. Mante* are unisexual.

The seed-scar differences are very evident in the *P. campechiana* (H.B.K.) Baehni, *P. laeteviridis* (Pittier) Lundell and *P. Mante* Lundell complex. The shape and size of the seed-scar appear to be correlated with the number of seed. Those species having fruit with one or few seed have broad elliptic seed-scars, those with numerous crowded seed have seed compressed ventrally with narrow linear seed-scars.

Pouteria odorata Lundell, sp. nov. — Arbor glabra; ramuli crassiusculi; folia petiolata, petiolo 1.5–2 cm. longo; lamina chartacea, obovata, oblanceolata vel oblonga, 6–12.5 cm. longa, 2.5–5.5 cm. lata, apice subabrupte acute subacuminata, basi subcuneata, acuta, nervis lateralibus 9–12-jugis; flores 8–10, fasciculati; pedicelli ad 1.4 cm. longi; sepala 5 vel 6, imbricata,

parce sericea, ovato-elliptica, 4–4.5 mm. longa, apice rotundata; gamopetala; corolla ca. 8 mm. longa, tubo campanulato, 2.5–3 mm. longo, glabro; lobis trilobatis; staminodia late ovata, 3.5–4 mm. longa, intus pubescentia, apice erosa vel subfimbriata; stamina glabra; filamenta 3.5–4 mm. longa, crassa; antherae lanceolatae, ca. 2 mm. longae; ovarium glabrum, 5-loculare; fructus ovoideus vel ellipsoideus, ca. 2 cm. longus; area derasa late elliptica; endosperma nulla.

Tree, about 22 m. tall, 45 cm. diam., unarmed; branchlets rather stout, glabrous, blackish with age; leaves at apex of branchlets, entirely glabrous, petiolate, the petioles rather slender, canaliculate, 1.4–2 cm. long, drying blackish; leaf blades chartaceous, paler beneath, obovate, oblanceolate or oblong, 6–12.5 cm. long, 2.5–5.5 cm. wide, apex subabruptly acuminate, the acumen up to 1 cm. long, acute, base subcuneate, acute, decurrent on the petiole, the midvein elevated beneath, nearly plane above, the primary lateral veins slender, 9–12-pairs, arcuately ascending at a wide angle, finely reticulate-veined on both surfaces, the upper surface shiny; flowers fasciculate in the leaf axils and at nodes below the leaves, with mostly 8 to 10 flowers in each fascicle; pedicels of flowers glabrous, slender, up to 1.4 cm. long. thickened and rigid in fruit; sepals 5 or 6, coriaceous, strongly imbricate, the outer rather sparsely sericeous above on both surfaces, the innermost glabrous, ovate-elliptic, 4–4.5 mm, long, rounded at apex; gamopetalous, corolla about 8 mm. long; the tube campanulate, 2.5–3 mm. long, glabrous; corolla lobes 5, up to 5 mm. long, 3-lobed to middle, the central lobe elliptic, rounded at apex, up to 4 mm. long, much longer than the obliquely ovate, long acuminate lateral lobes, the lateral lobes sparsely pubescent at base within with long thin shaggy hairs; staminodia petaloid, large, broadly ovate, 3.5–4 mm. long, about 3 mm. wide at base, apex erose or subfimbriate, the staminodia thin, of same texture as corolla lobes, sparsely pubescent at base on inner surface with long finely shaggy hairs; stamens glabrous, inserted at apex of corolla tube, the filaments thick, rounded, equalling the staminodia; anthers versatile, lanceolate, about 2 mm. long, obtuse at apex; ovary and style greenish, about 5 mm. long, the ovary tapering into style, the stigma punctiform, the ovary shallowly 5-ribbed, 5-loculate, with one ovule in each locule; immature fruits ovoid or ellipsoid, about 2 cm. long, tapering into the style base, sharply apiculate at apex; seed-coat thick; seed-scar lateral, broadly elliptic, covering about one-third of seed; cotyledons thick, endosperm absent.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on hillside, west of km. 161/162, Aug. 22, 1975, *C. L. Lundell & Elias Contreras 19705* (LL, type), tree, 75 ft. high, 18 in. diam., flowers white, fragrant, "*zapotillo*"; same locality, *Lundell & Contreras 19711* (LL), tree, 70 ft. high, 15 in. diam., immature fruit green.

Except for the sparsely pubescent flowers, the species is entirely glabrous. The large thin petaloid staminodia and the prominent central lobe of the corolla lobes are conspicuous features of *P. odorata*.

SOLANACEAE

Markea Gentlei Lundell, sp. nov. — Frutex epiphyticus; ramuli crassi, apice minute hispiduli; folia breviter petiolata, petiolo 5–12 mm. longo; lamina chartacea, glabrata, lanceolato-elliptica vel oblongo-elliptica, 9.5–12 cm. longa, 2.5–4.2 cm. lata, apice acuta vel subacuminata, basi attenuata, acuta, nervis lateralibus ca. 6-jugis; inflorescentia longe pedunculata, apice minute hispidula; pedicelli fructiferi minute hispidulo-puberuli, subclavati, ad 2.4 cm longi; calyx basi rugulosus, ad 2 cm. longus; lobis 5, liberis, lanceolatis, 7–10 mm. latis, acutiusculis, extus minute puberulis; fructus ca. 1.6 cm. longus; semina ca. 2.8 mm. longa.

Epiphytic shrub; old branches thick, deeply scarred by leaf scars, glabrate, terminal new growth minutely hispidulous; leaves crowded at apex of branches with petioles hispidulous at base, and obscurely so otherwise and along costa, glabrate early, the petioles slender, 5–12 mm. long, canaliculate; leaf blades thin, chartaceous at maturity, lanceolate-elliptic or oblong-elliptic, 9.5–12 cm. long, 2.5–4.2 cm. wide, apex acute or with short acumen less than 5 mm. long, base acute and attenuate on petiole, the margin revolute, midvein elevated beneath, narrow and raised on upper surface, the primary lateral veins very slender, not over 6 pairs, widely arcuately ascending, the venation rather obscure on both surfaces; flowers few, produced at the end of old long cord-like, pendent peduncle; peduncle rather stout, up to 45 cm. long, minutely hispidulous apically, the rachis scarred by the prominent pedicel scars, sometimes branched; pedicels hispidulous-puberulent, rigid, thickening above and slender-clavate, up to 2.4 cm. long in fruit; flower buds obovoid, puberulent, drying blackish, the sepals valvate, obtusish at apex; calyx of fruit rugose at base, 1.5–2 cm. long, 5-lobed, almost to base, the lobes lanceolate, 7–10 mm. wide, acutish or obtusish at apex, sparsely and minutely puberulent on outer surface, chartaceous, smooth, veiny; fruits ovoid-ellipsoid, about 1.6 cm. long; seeds about 2.8 mm. long.

British Honduras: Toledo District, in high ridge, on hilltop beyond Central Camp, Edwards Road beyond Columbia, June 21, 1951, *Percy H. Gentle 7373* (LL, type), epiphytic shrub, on tree.

M. Gentlei is related to *M. neurantha* Hemsley. It differs notably from that taxon in having smaller leaves mostly acute at apex, shorter petioles, fruiting pedicels rigid and slender-clavate, not over 2.4 cm. long. Its lanceolate calyx-lobes, free almost to base, are smooth, not ridged, and acutish or obtuse at apex. The seeds are larger, up to 2.8 mm. long.

C. L. Lundell & Elias Contreras 19468 (LL), collected at La Cumbre in Peten east of km. 142 of road, on June 29, 1975, is referable to this species. It is in fruit also.

Markea neurantha Hemsley, Biol. Cent. Am. Bot. 2: 429. 1882.

British Honduras: Toledo District, in forest, Rio Grande, June 29, 1944, *Percy H. Gentle 4668* (LL), epiphytic shrub, flowers greenish.

This is a rare plant in our area. The caudate elongated leaves have a filiform acumen, and the very slender pedicels of the flowers are up to 5.5 cm. long, unusually long for the species.

Markea tomentosa Lundell, sp. nov. – Frutex epiphyticus; ramuli crassi, ad 1 cm. diam., novelli stellato-tomentosi; folia subsessilia, petiolo 2–4.5 mm. longo; lamina chartacea, ovato-elliptica, ovato-orbicularia vel obovato-elliptica, ad 12 cm. longa, 8.8 cm. lata, apice rotundata et subabrupte subacuminata, basi rotundata, subtus dense et minute stellato-tomentosa, supra glabrata, nervis lateralibus 5–7-jugis; inflorescentia cymosa, terminalis, 5–7 cm. longa, pauciflora, minute stellato-tomentosa; pedicelli fructiferi clavati, 8–14 mm. longi; calyx ad 3.5 cm. longus, extus minute stellato-tomentosus; lobis 5, lanceolatis, ad 1.3 cm. latis, apice acutis; fructus subglobosus, 1.2–1.8 cm. longus; semina reniforma, 4 mm. longa; stylus 3 cm. longus, apice clavatus.

Epiphytic shrub, with thick branchlets drying up to 1 cm. in diam., the branchlets tawny-tomentose at first with fine stellate hairs, glabrate early; leaves subsessile, tawny-tomentose with fine stellate hairs, glabrate above, otherwise with persistent tomentum, the petioles very short, 2–4.5 mm. long, canaliculate; leaf blades thin, drying chartaceous, blackened above, ovate-elliptic, ovate-orbicular or obovate-elliptic, 7–12 cm. long, 3.5–8.8 cm. wide, apex rounded and rather abruptly subacuminate, the wide acumen not over 5 mm. long, obtusish, base rounded, decurrent on petiole, the lower surface persistently tomentose with short tawny stellate hairs, the midvein elevated beneath, nearly plane above, the primary lateral veins 6–8 pairs, slender, widely ascending, obscured beneath by the tomentum, inconspicuous above; inflorescence cymose, terminal, 5–7 cm. long, few-flowered, persistently tawny-tomentose with fine stellate hairs, the peduncle and branches of cymes thick, angled when dry; fruiting pedicels stout, 8–14 mm. long, drying angled, thickened above, finely tawny-tomentose; calyx 5-lobed, 2.5–3.5 cm. long in fruit, the lobes chartaceous, lanceolate, up to 1.3 cm. wide, sometimes free to base, acute at apex, minutely tawny-tomentose on outer surface, glabrous within, veiny but smooth; fruit subglobose, 1.2–1.8 cm. long, glabrous; seeds kidney-shaped, fully 4 mm. long; style filiform, at least 3 cm. long, clavate at apex.

Mexico: Chiapas, Margaritas, near Comitan, alt. 1530 m., June 6, 1945, *Eizi Matuda 5777* (LL, type), epiphytic shrub.

Of possible affinity to *M. uniflora* Lundell, its fine tawny stellate tomentum, subsessile broad leaves and short thick pedicels immediately set it apart from that taxon and all others reported from the region.

Markea uniflora Lundell, Phytologia 1: 340. 1939.

Mexico: Chiapas, Chiquihuite, Volcan de Tacana, alt. 2800 m., March 27, 1939, *Eizi Matuda 2816* (LL, isotype), epiphytic shrub; Niquivil, near Motozintla, in virgin forest, alt. 2786 m., May 15, 1945, *Matuda 5499* (LL), a woody vine.

This species is known also from Guatemala, *Julian Steyermark 36465* (F) southeast slopes of Volcan de Tacana, in wet forests, 2000–3000 m.

BELICEODENDRON, A NEW GENUS IN THE LEGUMINOSAE (CERCIDEAE) FROM CENTRAL AMERICA

Cyrus Longworth Lundell

The difficulty in securing specimens of giants of the tropical forests makes them the least known of the trees. The new genus *Beliceodendron* is a striking example. Although the tree was described by Paul C. Standley in 1929, from incomplete material, I have also been accumulating similar unsatisfactory specimens since 1944. In that year it was collected by Percy H. Gentle in British Honduras in bud. Not until flowering specimens were secured in the Department of Peten, Guatemala in May, 1975 was it possible to place the taxon, which apparently represents an undescribed genus as Standley suspected.

A similar giant tree of the Leguminosae, described from Peten as *Tipuana Lundellii* Standl. in 1935, and transferred by E. P. Killip to *Vatairea* in 1940, has not been collected in the same area since I discovered it at La Libertad in 1933. But the tree is now known to range from Veracruz in Mexico southward to Nicaragua where it is reported to be a common forest giant.

Beliceodendron Lundell, gen. nov—Arbor gigas; stipulae binae, linearioblongae, rigidae, persistentes; folia alterna, simplicia, petiolata, glabra; lamina subcoriacea, lanceolata, oblongo-elliptica vel obovato-elliptica, apice breviter vel caudato-acuminata, basi inaequalis, acuta vel obtusiuscula vel raro rotundata, remote serrata, fere concolor, nervis supra prominentibus et reticulatis, costa subtus elevata, nervis lateralibus 5–6-jugis, gracilibus, adscendentibus, arcuatis, prope marginem conjunctis, nervulis prominulis et arcte reticulatis; inflorescentia axillaris, racemosa, fasciculata, puberula, ad 7.5 cm. longa; flores pedicellati; pedicelli apice bibracteolati; alabastra obovoidea, parce puberula, apice minute 5-dentata; calyx subgibbosus, campanulatus, apice annulatus, minute 5-dentatus, ca. 5 mm. longus; petala 5, ca. 9 mm. longa, inaequalia, unguiculata, exteriora late ovata, ca. 6 mm. longa; stamina 10, biseriata, 4–5.5 mm. longa, glabra; filamenta subulata, 3.5–4 mm. longa; antherae erectae, ovato-oblongae, ca. 1.3 mm. longae, apice barbatae, apiculatae; ovarium stipitatum, pilosum, inaequilateralum; ovula 4–6, uniseriata; stylus elongatus, ca. 6 mm. longus; stigma punctiforma; fructus maturus globosus, ad 4 cm. diam.; semen oblongo-ellipsoideum, ad 3 cm. longum.

Type species: *Beliceodendron Tango* (Standl.) Lundell (= *Zollernia Tango* Standl.).

The genus commemorates the name Belice, the Spanish designation of what is now known as Belize, formerly British Honduras.

The subgibbous calyx is closed in bud except for the small minutely 5-dentate aperture at apex. It rapidly expands and becomes campanulate at anthesis. Annulate at apex, the 5 small tooth-like lobes persist on the otherwise smooth entire rim. These unique features, together with the simple alternate serrulate or serrate leaves, 5 petals, 10 stamens in 2 series, and globose indehiscent fruits distinguish *Beliceodendron*.

In describing the tree, *Zollernia Tango* (Tropical Woods 19: 6–7. 1929), Standley had incomplete material, and stated: "When the flowers are collected they may show that the tree represents a distinct generic type, but, if so, it must be a close relative of *Zollernia*, a genus known heretofore only from Brazil." He goes on to state: "The simple leaves, the rigid binate stipules, and the toothing of the leaves all point definitely to the genus *Zollernia*, which is related to the better-known group *Swartzia*."

Although referred to the Swartzieae by Standley, I do not find a close relationship to the genera usually referred here. The simple serrulate or serrate leaves, peculiar calyx with minute tooth-like lobes which persist at anthesis on the rim of a widely expanded campanulate tube, the yellow flowers, 4–6 uniseriate ovules, and the mature globose fruits to 4 cm. in diameter with large seeds represent a series of unique characteristics. The features of the calyx, the elongated filaments, and the ovules, few in number, rather than numerous, distinguish *Beliceodendron* from *Zollernia*.

I refer *Beliceodendron* to the Cercideae (Bauhinieae) in accordance with the division of the Leguminosae into tribes by Willis (A Dictionary of the Flowering Plants and Ferns, 7th. ed., p. 630. 1966).

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Beliceodendron Tango (Standl.) Lundell, comb. nov. *Zollernia Tango* Standl., Tropical Woods 19: 6–7. 1929.

Large tree, up to 26 m. tall, 50 cm. diam., entirely glabrous, except for the inflorescence, the branchlets slender, angled; stipules linear-oblong, up to 3 mm. long, rigid with age, persistent; leaves alternate, simple, the petioles rugose, short, 2–5 mm. long, rather stout; leaf blades subcoriaceous, lanceolate, oblong-elliptic or obovate-elliptic, 5–18 cm. long, 2–7.5 cm. wide, apex short acuminate to caudate-acuminate, the acumen acute or obtusish, base unequal and acute, obtuse or rounded, margin rather remotely serrulate or serrate, paler beneath, the midvein elevated beneath, sulcate above and ridged, the primary lateral veins slender, 5–8-pairs, mostly ascending at a sharp angle, the veins closely reticulate; racemes axillary, fasciculate, up to 7.5 cm. long, slender, puberulent; flowers yellow; pedicels 2–4 mm. long, puberulent, subtended by bractlet, bearing a pair of slender linear bractlets about 1 mm. long at base of calyx; calyx closed in bud, except for apical aperture, obovoid, subgibbous at base, rather sparsely puberulent, the apical aperture small, ciliate, with 5 small tooth-like calyx lobes; calyx widely expanded at anthesis, campanulate, about 5 mm. long, the margin flaring and annulate, the top of rim smooth except for the small persistent scarely discernible calyx lobes, sparsely ciliate; petals 5, glabrous, subequal in length, about 9 mm. long, attached within above base of calyx tube, wide-clawed, the claw equalling calyx tube, the blades unequal in width, the standard in bud enveloping the other petals, broadly ovate, about 6 mm. long, tapering at base into claw, obtuse or rounded at apex, the blades of other petals lanceolate, the margins of petals rolled inward at anthesis; stamens 10, 4–5.5 mm. long, biseriate, glabrous, attached above base of calyx tube; the filaments slender, elongated, 3.5–4 mm. long, glabrous; anthers erect, ovate-oblong, about 1.3 mm. long, apex barbate and apiculate, longitudinally dehiscent;

ovary stipitate, pubescent, the stipe at anthesis about 2 mm. long, the ovary oblongish, inaequilateral, about 4 mm. long, tapering into the stout exserted style, the style about 6 mm. long, pubescent at base, the stigma punctiform and obliquely terminal; ovules 4–6, in a single series along ventral suture; immature fruits oblongish, rounded at each end; pedicel of fruits accrescent, up to 6 mm. long; mature fruits apparently indehiscent, globose, up to 4 cm. in diameter; seed oblong, rounded at each end, 2.5–3 cm. long, 1.5 cm. wide, flattened.

Honduras: Dept. Atlantida, in wet forest, Lancetilla Valley near Tela, alt. about 150 m., Feb. 3, 1928, *Paul C. Standley 55535* (F, type), a large forest tree with deeply fluted trunk.

British Honduras: Toledo District, in high ridge, Temash River, June 5, 1944, *Percy H. Gentle 4650* (LL), tree, 6 in. diam., flowers creamish color, bark grayish-white, wood brown and hard; Feeder Road, leading to Big Fall, in cohune ridge, May 2, 1950, *Gentle 7043* (LL), large tree, bark grayish color, wood creamish color, hard; mature fruit and seed.

Guatemala: Dept. Peten, La Cumbre, in high forest, west of km. 140 of Cadenas Road, Aug. 1, 1969, *Elias Contreras 8817* (LL), tree, 20 in. diam., 80 ft. high; Cadenas, on bank of Rio Gracias a Dios, west of km. 169 of Poptun Road, in high forest, Sept. 16, 1969, *Contreras 9182* (LL), tree, 12 in. diam., 60 ft. high; La Cumbre, in high forest, *zapotal*, east of km. 141 of road, May 30, 1975, *C. L. Lundell & Elias Contreras 19369* (LL, flowers), tree, 80 ft. high. 20 in. diam., flowers yellow. Dept. Izabal, Puerto Mendez (Cadenas), bordering Rio Gracias a Dios, 2 km. N.W. in *corozal*, Sept. 17, 1969, *Contreras 9194* (LL), tree, 12 in. diam., 50 ft. high.

Paul C. Standley (l.c., p. 7) describes *B. Tango* as follows: "A large forest tree with deeply fluted trunk, common in the region of Lancetilla, known in both Honduras and British Honduras by the vernacular name *Tango*. About Tela the wood is used for cabinet work and construction purposes, and for the manufacture of axe handles."

TAXONOMIC STUDY OF GAILLARDIA PULCHELLA (ASTERACEAE – HELIANTHEAE)

B. L. Turner and Molly Whalen[1]

Abstract

Gaillardia pulchella Foug. (including *G. neomexicana* Nels.) is treated as comprised of three allopatric varieties: (1) var. *pulchella*, a widespread, weedy, highly variable taxon of central and northern Texas and the mid-western United States generally; (2) var. *picta* (Sweet) Gray, a taxon of dune sands along the Gulf of Mexico; and (3) var. *australis* Turner & Whalen, a newly recognized taxon which is confined to southern Texas and adjacent Mexico. Keys and distributional maps are presented.

Gaillardia pulchella Foug., commonly referred to as Indian Blanket or Blanket Flower, is a widespread weedy species that was taken into cultivation soon after its discovery in the New World during the late 18th century. In spite of its wide use as an ornamental in gardens (from which it frequently escapes), relatively few studies have been made of its wild populations and their taxonomic status. Rydberg (1915) and Biddulph (1944) provided provisional accounts of the species in their treatments of the genus, the former mostly splitting and the latter lumping the various formal names proposed for elements of this exceedingly variable taxon. Stoutamire (1955; 1958) studied various selected populations cytogenetically, noting that "Morphological and cytological differences exist between wild races of *Gaillardia pulchella*, and these differences persist when plants are grown in a standard habitat." but he did not provide a taxonomic treatment for the species or its allies.

Our interest in *Gaillardia pulchella* stems from attempts to distinguish the species from both *G. neomexicana* Nels. (which was recognized by Biddulph) and *G. amblyodon* Gray. As indicated below, we readily distinguish the latter but reckon the former to be synonymous with *G. pulchella*. In pursuing this study, and after examining numerous populations of this taxon in Texas and neighboring areas, we believe we possess sufficient knowledge of its regional variation so as to offer a meaningful taxonomic treatment of the species.

We have utilized the several hundred specimens on deposit in The University of Texas (TEX) and C. L. Lundell (LL) herbaria at Austin. These collections, all annotated, are mapped in Fig. 15 and a more formal descriptive account of the taxonomy concerned follows.

Gaillardia amblyodon is readily separable from *G. pulchella* both by its rays (dark red throughout as noted by Biddulph) and dimorphic achenes (achenes of the ray possessing non-aristate pappus scales, the pappus of disk achenes aristate). The two species are sympatric in central Texas and often occur near each other along roadsides. In spite of searches among such populations, hybrid intermediates have not been observed.

The specific status of *G. amblyodon* having been amply demonstrated, we now turn our attention to *G. pulchella*, which is treated as comprised of three allopatric varieties which may be recognized by the following key.

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1. Plants much-branched with widely spreading secondary branches, usually forming compact, rounded bushes; leaves usually thickened and semisucculent; populations of Gulf coastal dune sands (adventive in Florida and the southeastern Atlantic coastal region) ..... 1b. var. *picta*

1. Plants with erect primary stems and stiffly ascending secondary branches, not forming rounded bushes; leaves not thickened and semisucculent; populations of inland regions (2).

2. Mid-stem leaves conspicuously lobate; populations of southern Texas and adjacent Mexico (Fig. 15) ..... 1c. var. *australis*

2. Mid-stem leaves entire to merely dentate; populations of central Texas and regions to the west and north, but widely distributed as a weed along roadsides to the east, especially in calcareous soils (intergrades with var. *australis* in south-central Texas). ..... la. var. *pulchella*

1a. **Gaillardia pulchella** Foug. var. **pulchella.**

Biddulph (1944) lists several species names in synonymy with this taxon from which we would extricate *G. pulchella* var. *picta* (= *G. picta*) and *G. pulchella* var. *australis* (= *G. lobata*) which are treated below. In addition we would add *G. neomexicana* to her list of synonyms.

Var. *pulchella* is diploid with $n = 17$ pairs (Turner, 1972). All of the populations studied cytogenetically by Stoutamire (1958), except one (var. *picta*), belong to this taxon. He reported reduced fertility (ranging from 50 to 80%) among crosses between races from north of and south of the Brazos River. Like him we can not distinguish among these races using morphological characters. The fertility of synthetic hybrids between var. *pulchella* (as represented by the races referred to) and var. *picta* from Galveston Island ranged between 9 and 39%, suggesting a greater genetric divergence for the latter population; indeed, the var. *picta* is quite readily recognized, especially in the field.

Biddulph keyed *G. neomexicana* as perennial, thus distinguishing it from the annual *G. pulchella*. However, she describes the former as a "biennial or sometimes persisting as a short-lived perennial," noting that *G. neomexicana* "is perhaps only the westward extension of *G. pulchella*" differing in the color of the rays and hairiness of the achenes. We agree with her comments regarding its relationship to *G. pulchella* but fail to find it perennial or especially different in ray color or fruit pubescence. In fact, we can not accord these western populations of *G. pulchella* even varietal rank since there is seemingly an imperceptible intergradation between the western and eastern populations, the former appearing somewhat more branched at the base with paler rays, there being considerable variation in these characters within populations in both of the areas concerned. Stoutamire (1955) would presumably also agree with these observations since he treated at least 4 collections from New Mexico as part of the *G. pulchella* complex.

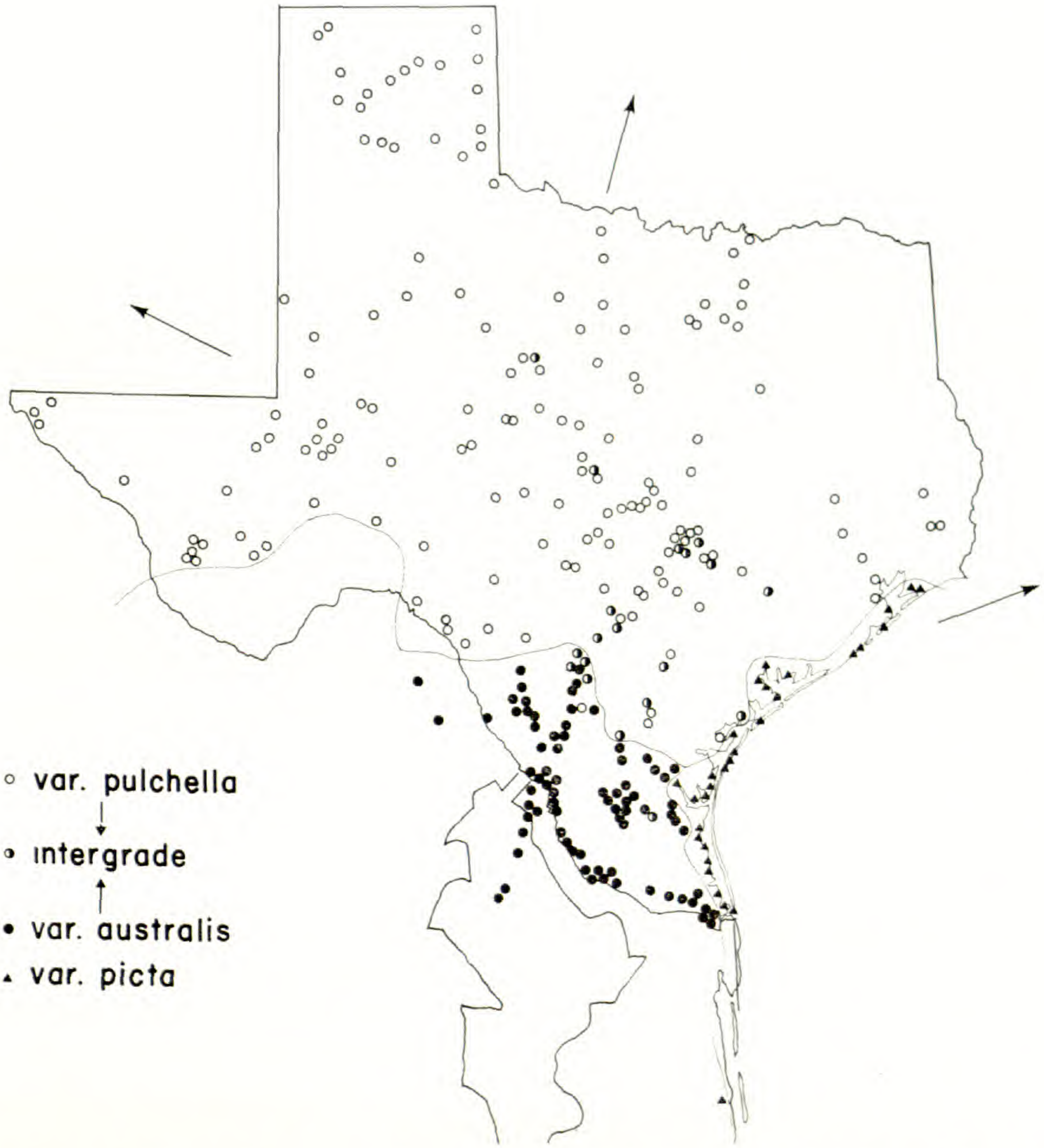

Fig. 15. Distribution of the varieties of *Gaillardia pulchella* in Texas and adjacent Mexico; based upon specimens in The University of Texas herbaria (LL, TEX). Arrows indicate that populations of the taxa concerned extend into regions beyond that under study.

1b. **Gaillardia pulchella** var. **picta** (Sweet) Gray

This is a robust, somewhat succulent, coastal taxon originally confined to sand dunes along the Texas coast and adjacent Mexico but since sporadically introduced along the Atlantic coastline of the United States. Biddulph (1944) thought the taxon might have some validity, noting that it occupied the sandy shores of the Gulf Coast, but, strangely, did not accord it varietal rank "Because it does not fill an ecological niche alone, or completely . . ." In view of its habitat predilection we fail to compre-

hend the remark. The variety is fairly well marked but occasional intergrades with var. *australis* may be found in the sandy areas of southernmost Texas; since the var. *pulchella* is generally confined to inland, mostly calcareous soils, it is not often found growing near var. *picta*, hence intergradation as a result of hybridization is largely precluded.

Texas populations of var. *picta* are reportedly diploid with $n = 17$ pairs (Stoutamire, 1958; also, *Watson 548*, and *Whalen 145*, TEX). However, isolated Mexican populations near the mouth of Rio Sota La Marina in the state of Tamaulipas (*Johnston 5055*, TEX), which we provisionally assign to this variety, are apparently diploid with $n = 18$ pairs. Additional data might show these seemingly disjunct Mexican populations to be sufficiently distinct to warrant nomenclatural recognition.

1c. **Gaillardia pulchella** var. **australis** Turner & Whalen, var. nov. — A varietate typica foliis conspicue lobatis pilis crispatis, statura saepe parviore, ramis basalibus numerosioribus differt.

Differing from the other varieties by its conspicuously lobed leaves, crisped pubescence and generally smaller stature with more basal branching. Holotype: Texas. Dimmit Co.: in sandy soil about 12 mi. NW of Carrizo Springs, Apr. 4, 1959, *D. S. Correll 20740* (LL). Numerous additional collections of the taxon are on file in The University of Texas combined herbaria (LL, TEX) and are mapped in Fig. 15.

The variety was first recognized as a species, *G. lobata* Buckl. (Proc. Acad. Philadel. 13: 459. 1862; holotype, PH!), but we prefer to treat it as a regional variety of *G. pulchella*, thus emphasizing its geographical nature rather than its most striking morphological feature, deeply lobed leaves; the latter character occurs sporadically over a broad range of more northern populations which clearly belong to the var. *pulchella*. Prof. M. C. Johnston, through annotations on herbarium specimens, also recognized the taxon, referring to this as a "South Texas" race of *G. pulchella*. The var. *australis* intergrades to some considerable extent with var. *pulchella* in regions of contact; it also appears to intergrade with the var. *picta*, especially in the extensive inland dune region of Kenedy County.

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STUDIES OF AMERICAN PLANTS–XI

CYRUS LONGWORTH LUNDELL

Among specimens recently received from the Missouri Botanical Garden, another species in the Celastraceae, which I name *Crossopetalum panamense*, is added to the flora of Panama. From the collections of Al Gentry and Scott Mori, all from southern Panama, two genera of South American Myrsinaceae, *Conomorpha* and *Cybianthus*, both represented by undescribed taxa, further increase the already rich Panamanian representation of this family. A third taxon in the Myrsinaceae, *Ardisia perpuncticulosa*, is described from Cerro Tacarcuna on the border between Panama and Colombia.

Included in the Sapotaceae are two additional novelties in the genus *Mastichodendron* from Guatemala, a new combination in *Dipholis*, and new records for *Pouteria gallifructa* Cronquist.

CELASTRACEAE

Crossopetalum panamense Lundell, sp. nov. — Arbor parva; ramuli 4-angulati, glabri, graciles; folia parva, glabra, petiolata, petiolo 3–3.5 mm. longo; lamina membranacea, lanceolata, 4–7 cm. longa, 1.3–3 cm. lata, apice caudato-acuminata, basi acuta; inflorescentia laxe cymosa, axillaris, dense et minute puberula; pedicelli 2–2.5 mm. longi, graciles; sepala 4, parva, late ovata, 0.6–0.7 mm. longa, dense puberula; petala 4, erecta, anguste ovato-oblonga, ca. 2 mm. longa, apice rotundata; stamina ca. 0.8 mm. longa; ovarium 2-loculare.

Small tree 10 m. tall; branchlets very slender, the nodes flattened, the internodes sharply 4-angled, glabrous; leaves small, glabrous, the petioles up to 3.5 mm. long, canaliculate; leaves dark green, membranaceous, lanceolate, 4–7 cm. long, 1.3–3 cm. wide, apex caudate-acuminate, subfalcate at times, base acute, the costa elevated on both surfaces, the primary lateral veins very slender, inconspicuous, the margin crenulate-serrulate to the base; inflorescence lax, puberulent, axillary, openly cymose, branched up to 4 times, with very slender elongate peduncle and primary branches; pedicels short, slender, 2–2.5 mm. long; sepals 4, small, ovate-rounded, 0.6–0.7 mm. long, densely puberulent; petals 4, reddish, erect, glabrous, narrowly ovate-oblong or lanceolate-oblong, up to 2 mm. long, rounded at apex; stamens 4, attached inside of shallow thin disk at the corners, the filaments suberect, reflexed above, about 0.7 mm. long; anthers minute; ovary glabrous, tapering into the slender style, subequalling stamens; ovary 2-loculate, with 1 ovule in each locule.

Panama: Prov. Colon, 10 miles southwest of Puertobello, 2–4 miles from coast, alt. 10–200 m., March 24, 1973, *R. L. Liesner 1052* (LL, type), 10 m. tree, very hard wood, petals reddish.

C. panamense is closely related to *C. parviflorum* (Hemsl.) Lundell, differing in its caudate-acuminate leaves, glabrous internodes, and in having ovate-oblong petals. In the type of *C. parviflorum* the petals are obovate and distinctly narrowed into a claw at base. In *C. panamense* the petals are widest at base, not clawed.

MYRSINACEAE

Ardisia perpuncticulosa Lundell, sp. nov. — Arbor, 8 m. alta; ramuli crassiusculi, novelli minute lepidoti, glabrati; folia petiolata, petiolo marginato, 1–1.5 cm. longo, minute et parce lepidoto; lamina membranacea, supra glabra, multipuncticulosa, subtus parce lepidota, obovata, 13.5–17 cm. longa, 6–8 cm. lata, apice subabrupte breviter acuminata vel obtusiuscula, basi late cuneata; inflorescentia terminalis, sessilis, paniculata, 8–13 cm. longa, pyramidalis, minute lepidota, multiflora; pedicelli fructiferi crassi, 0.3–1 mm. longi; sepala 5, lanceolato-oblonga vel elliptica, ca. 1.5 mm. longa, punctata; fructus globosus, punctatus.

Tree, 8 m. tall; branchlets rather slender, minutely lepidote at first; leaves aggregated at terminal nodes, petiolate, the petioles inconspicuously marginate, rather thick, 1–1.5 cm. long, sparsely reddish-lepidote; leaf blades membranaceous, glabrous above, and densely and very minutely puncticulose, sparsely lepidote beneath, obovate, 13.5–17 cm. long, 6–8 cm. wide, apex rather abruptly subacuminate or obtusish, base broadly cuneate; inflorescence terminal, sessile, paniculate, 8–13 cm. long, pyramidal, minutely reddish-lepidote, multiflowered; fruits subsessile, crowded, the thick pedicels only 0.3–1 mm. long; sepals 5, lanceolate-oblong or elliptic, about 1.5 mm. long, punctate, minutely erose; fruits globose, 3.5–4 mm. in diameter, punctate.

Panama: Prov. Darien, vicinity of Cerro Tacarcuna, summit camp, along stream N of camp, alt. 1550–1650 m., lower montane wet forest life zone, Feb. 1, 1975, *Al Gentry & S. Mori 14049* (LL, type), tree, 8 m., fruits turning reddish.

In the absence of flowers the generic position of the species is uncertain. The sessile inflorescence is suggestive of *Gentlea*. I know of no other species in the neotropics with upper leaf surface so densely puncticulose.

Conomorpha Gentryi Lundell, sp. nov. — Frutex, 3 m. altus; ramuli gracillimi, dense rufo-lepidoti; folia petiolata, petiolo ad 1 cm. longo, canaliculato; lamina membranacea, obovata vel oblanceolata, 8–10 cm. longa, 3–4 cm. lata, apice subabrupte breviter acuminata, basi cuneata, integra, supra glabra, costa impressa, subtus prominente rufo-lepidota, costa elevata, nervis lateralibus 7–9-jugis; infructescentia racemosa, axillaris, pauciflora, ad 3.5 cm. longa, dense glandulo-lepidota; pedicelli fructiferi crassi, 1.5–2.5 mm. longi; bracteae 1–1.5 mm. longae; sepala 4 vel 5, ovata, ca. 1 mm. longa, glandulo-lepidota; fructus globosus, ad 6 mm. diam.

Shrub, 3 m. tall, the branchlets slender, densely rufous-lepidote; leaves with slender lepidote petioles up to 1 cm. long; leaf blades membranaceous, obovate or oblanceolate, 8–10 cm. long, 3–4 cm. wide, apex rather abruptly short acuminate, the base cuneate, decurrent on the petiole, the margin entire, glabrous above with the midvein impressed, prominently glandular-lepidote beneath, the glands small and red, the midvein elevated beneath, the primary veins slender, inconspicuous, 7–9-pairs, rather irregularly spaced; inflorescence strictly racemose, axillary, few-flowered, up to 3.5 cm. long, densely glandular-lepidote; fruiting pedicels thick, 1.5–2.5 mm. long, with narrow bractlet at base, 1–1.5 mm. long; sepals 4 or 5, ovate or

deltoid-ovate, about 1 mm. long, acute, entire, thin, glandular-lepidote with small red rather uniformly distributed glands, glabrous within; fruits globose, up to 6 mm. in diam., black, shiny.

Panama: Prov. Panama, Cerro Jefe, alt. 800–1000 m., cloud forest, along road past Escuela, Altos de Pacora, 16–20 km. E of Cerro Azul village, Jan. 5, 1975, *Al Gentry & Scott Mori 13434* (LL, type), shrub 3 m., fruits black.

The genus has not been recorded before from Panama, but was to be expected. In the absence of flowers, only fruits being available, the relationships of *C. Gentryi* can not be ascertained. I have not been able to associate the species with any known to me.

Cybianthus Gentryi Lundell, sp. nov. – Frutex vel arbor parva; ramuli graciles, minute rufo-lepidoti; folia longe petiolata, petiolo 1–2 cm. longo, canaliculato, rufo-lepidoto; lamina parce rufo-lepidota, membranacea, elliptica, lanceolata vel oblanceolata, 6–14 cm. longa, 2.2–5 cm. lata, apice subabrupte acuminata, basi acuta, integra vel subintegra, punctis magnis prominentibus subpaucis aucta; flores 4-meri, unisexuales; masculi laxe bipinnatim paniculati, minute stipitato-glandulosi; pedicelli ad 2.5 mm. longi; sepala elliptica, ca. 1 mm. longa, pauci aurantiaco-punctata, apice rotundata; gamopetala; petala imbricata, late ovato-elliptica, ca. 2 mm. longa, apice rotundata, integra, pauce aurantiaco-punctata, intus minute glanduloso-lepidota; filamenta ad 0.8 mm. longa; antherae parvae, introrsum rimis elongatis fere basin usque dehiscentes sed optime basifixae; ovarium abortivum.

Shrub or small tree, up to 4 m. tall, the branchlets slender, minutely and rather sparsely rufous-lepidote; leaves with slender rufous-lepidote petioles 1–2 cm. long; leaf blades sparsely rufous-lepidote on both surfaces, membranaceous, elliptic, lanceolate or oblanceolate, 6–14 cm. long, 2.2–5 cm. wide, apex usually subabruptly acuminate, base acute, the margin entire or subentire, rather sparsely but conspicuously punctate on the paler lower surface, costa elevated beneath, the primary lateral veins very slender, inconspicuous, 7–10-pairs; flowers unisexual. *Staminate flowers* strictly 4-parted, the inflorescence shorter than leaves, laxly bipinnately paniculate in leaf axils, minutely puberulent with gland-tipped hairs, the flowers few, racemose with pedicels up to 2.5 mm. long; sepals elliptic or elliptic-oblong, about 1 mm. long, punctate with several orange-red glands, the apex rounded; gamopetalous, rotate; petals imbricate, broadly ovate-elliptic, about 2 mm. long, apex rounded, entire, with few orange-red glands, the inner surface to base minutely glandular-lepidote; filaments attached at level of base of sinuses, up to 0.8 mm. long; anthers small, basifixed, dehiscent by slits almost to base; ovary small, abortive.

Colombia: Cerro Mali, on border with Panama, 1200–1400 m. alt., lower montane wet forest, premontane wet forest transition, Jan. 17, 1975, *A. Gentry & S. Mori 13709* (LL, type), shrub 2.5 m., flowers greenish.

Panama: Prov. Darien, top of Cerro Mali, lower montane wet forest life zone, alt. ca. 1400 m., Jan. 17, 1975, *Gentry & Mori 13665* (LL), tree 4 m., flowers greenish-cream.; top of W ridge of Cerro Tacarcuna, elfin

forest and transition between elfin forest and lower montane wet forest, alt. 1800–1850 m., Jan. 31, 1975, *Gentry & Mori 14023* (LL), shrub, fruits streaked green and reddish; Cerro Tacarcuna, W ridge, along quebrada above waterfall E of camp, alt. 1500–1550 m., Feb. 2, 1975, *Gentry & Mori 14095* (LL), small tree 4 m., flowers greenish.

Only a few species of *Cybianthus* have paniculate inflorescences, and of these, *C. Fendleri* Mez and *C. Klotzschii* Mez appear to be related to *C. Gentryi*. *C. Klotzschii* is a coarser plant with leaves up to 23 cm. long and 11 cm. wide, and its petals are emarginate. In leaf form, *C. Fendleri* resembles *C. Gentryi*, but the latter has flowers in racemes. The minute gland-tipped hairs of the inflorescence of *C. Gentryi* and the sparsely reddish-lepidote branchlets appear distinctive.

This South American genus is new to the flora of Panama.

SAPOTACEAE

Dipholis tabascensis (Lundell) Lundell, comb. nov. *Bumelia tabascensis* Lundell, Contr. Univ. Mich. Herb. 4: 22. 1940.

Mexico: Tabasco, Retiro, in advanced forest, June 19–25, 1939, *Eizi Matuda 3455* (LL, isotype), a tree, 18 m. high, 35 cm. in diameter.

Mastichodendron erythrocarpum Lundell, sp. nov. — Arbor; ramuli graciles, novelli rufo-sericei; folia glabra, petiolata, petiolo canaliculato, 1–3 cm. longo; lamina chartacea, lanceolata vel oblongo-lanceolata, 5.5–11 cm. longa, 2–4 cm. lata, apice acuminata, basi subabrupte acuta, costa supra impressa, nervis lateralibus 9–11-jugis; pedicelli fructiferi 4–6 mm. longi; sepala 5, imbricata, late rotundata, 2–2.5 mm. longa, intus glabra, ciliolata; fructus ellipsoideus vel ovoideo-ellipsoideus, ad 1.5 cm. longus; semina ca. 11 mm. longa; area derasa seminis basilateralis; albumen copiosum.

Tree, 20 m. tall, 38 cm. diam.; branchlets slender, sericeous apically at first with reddish hairs; leaves entirely glabrous, aggregated at ends of branchlets, with slender canaliculate petioles 1–3 cm. long; leaf blades chartaceous, lanceolate or oblong-lanceolate, 5.5–11 cm. long, 2–4 cm. wide, apex conspicuously acuminate, base rather abruptly acute, the midvein elevated beneath, impressed above, the primary lateral veins slender, 9–11-pairs, arcuately ascending, inconspicuous, reticulate on lower surface, the veins obscure above; fruits small, dark red, borne on old wood; fruiting pedicels 4–6 mm. long; sepals 5, imbricate, broadly rounded, 2–2.5 mm. long, the outer coriaceous, rugose, the inner thinner, glabrous within at base, ciliolate, fruits with thin flesh, drying rugose, ellipsoid or ovoid-ellipsoid, up to 1.5 cm. long, apiculate at apex with persistent base of style; seed about 11 mm. long, with basilateral oval scar 4 mm. long, 3 mm. wide; seed coat firm, about 0.7 mm. thick; endosperm copiose.

Guatemala: Dept. Izabal, Cadenas (Puerto Mendez), in low forest, top of rocky hill, bordering village on west, June 8, 1970, *Elias Contreras 9983* (LL, type), tree, 60 ft. high, 15 in. diam., fruit dark red.

Superficially, *M. erythrocarpum* resembles *M. belizense* (Lundell) Cronquist. That tree is described by W. A. Schipp as having yellow fruits

at maturity, and its coriaceous subacuminate leaves are quite different. The long acuminate, lanceolate, chartaceous leaves and small dark-red fruits well-mark the taxon.

Mastichodendron tikalense Lundell, sp. nov. – Arbor; ramuli novelli sericei; folia glabra, petiolata, petiolo 1.7–3 cm. longo; lamina subcoriacea, oblanceolata, lanceolata vel oblongo-elliptica, ad 11.5 cm. longa, 4.7 cm. lata, apice acuminata vel raro obtusa, basi acuta vel rotundata et acutiuscula, nervis lateralibus 5–7-jugis; pedicelli fructiferi percrassi, 2–3 mm. longi; sepala 5, glabra, imbricata, late rotundata, ca. 1.2 mm. longa; fructus obovoideus vel ellipsoideus, ad 3 cm. longus; semina ca. 2 cm. longa, area derasa seminis basilateralis; albumen copiosum.

Large tree, about 30 m. tall, 1 m. in diam.; branchlets glabrous, or very sparsely sericeous, drying blackish, the apical buds sericeous; leaves aggregated toward apex of branchlets, glabrous at maturity (in fruit), petioles slender, 1.7–3 cm. long, with narrow pouch at apex above; leaf blades subcoriaceous, oblanceolate, lanceolate or oblong-elliptic, 5.5–11.5 cm. long, 2.5–4.7 cm. wide, apex acuminate to obtuse, base acute or rounded and acutish, midvein elevated beneath, shallowly impressed above and ending at base in narrow grooved pouch, the primary lateral veins slender, sharply ascending at acute angle, 5–7-pairs, the veins openly and obscurely reticulate on both surfaces; fruits borne on old wood, solitary or in pairs; pedicels very short, thick, 2–3 mm. long; calyx glabrous; sepals 5, imbricate, small, broadly rounded, about 1.2 mm. long subtending fruits; fruits fleshy, obovoid or ellipsoid, drying 2.5–3 cm. long, abruptly apiculate, rounded at base; seed dark brown, ellipsoid, about 2 cm. long, with basilateral oblong-oval seed-scar 5–6 mm. long, 3 mm. wide; seed coat thick, hard, about 1 mm. thick; endosperm copiose.

Guatemala: Dept. Peten, Tikal National Park, in *zapotal*, on trail to *pinal*, March 4, 1961, *C. L. Lundell 16880* (LL, type), tree, 96 ft. tall, 36 in. diam., fruit green, "*tempixte*."

M. tikalense is notable for its large subsessile fruits with thick pedicels, comparatively short petioles, elongate leaves widest at or above middle, and large seed with hard seed-coat about 1 mm. thick. It appears to be related to *M. foetidissimum* (Jacq.) Cronquist.

Pouteria gallifructa Cronquist, Lloydia 9: 285. 1946.

British Honduras: Toledo District, Temash River, alt. 150 ft., March 2, 1935, *W. A. Schipp 1323* (F, MICH, isotypes), tall upright tree with straight trunk and dense crown, growing in primary forest, 90 ft., 30 in. diam., common; Temash River, alt. 200 ft., May 22, 1935, *Schipp 1357* (F, MICH), medium sized tree growing in primary forest, 45 ft., 10 in. diam., occasional, fruits gall-like.

Guatemala: Dept. Izabal, Cadenas (Puerto Mendez), in high forest, *zapotal*, Chocon, about 4 km. from the village, west of the Rio Dulce Road, March 3, 1975, *C. L. Lundell & Elias Contreras 19041* (LL), tree, 60 ft. high, 15 in. diam., flowers greenish-white; south of Chocon, about 6 km. from the village, in *zapotal*, March 4, 1975, *Lundell & Contreras 19046* (LL), *19047* (LL), tree, 80 to 95 ft. high, 25 to 30 in. diam., flowers greenish-white, "*zapote de mico*." Dept. Peten, La Cumbre, in high forest,

zapotal, west of km. 143/144 of the Peten-Izabal Road, March 15, 1975, *Lundell & Contreras 19103* (LL), *19105* (LL), tree 100 to 120 ft. high, 30 to 35 in. diam., flowers greenish-white, "*zapote de mico*."

Known previously only from the two Schipp collections from southern British Honduras, excellent flowering and fruiting material of the taxon has been collected in the primary rain forest of Guatemala in southeastern Peten and adjacent Izabal. Additional flowering and fruiting collections, other than those cited above, are in the Lundell Herbarium.

VOLUME 5 MAY, 1976 NUMBER 7

WRIGHTIA

A BOTANICAL JOURNAL

CONTENTS

PUBLISHED BY
THE UNIVERSITY OF TEXAS AT DALLAS
RICHARDSON, TEXAS

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. The contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume will contain a series of numbers. The numbers will be issued at irregular intervals.

VOLUME 5, NUMBER 7
ISSUED MAY 21, 1976

Printed in the U. S. A.
Etheridge Printing Company
Dallas, Texas

WRIGHTIA

VOLUME 5 MAY, 1976 NUMBER 7

THE 1931–1932 ODYSSEY IN CAMPECHE AND PETEN

CYRUS LONGWORTH LUNDELL[1]

INTRODUCTION

Transferred to Mexico from New York in September, 1931, I was stationed at Tuxpeña in southern Campeche, from October 4, 1931 through late February, 1932. This afforded an opportunity to explore a region practically unknown to botanists and archaeologists. Although in the employ of the Chicle Development Company of New York, I was in Mexico on a tourist card working for its subsidiary, the Mexican Exploitation Company with headquarters in the City of Campeche. With only tourist status, commercial activities were restricted.

On visits to chicle contractors of the Company and their camps scattered through the interior, I surveyed chicle operations, explored archaeological sites, and concurrently made a reconnaissance of the sapodilla forest, which included ecological and other botanical studies. Plant collections were made on the bush trips, but the most extensive series was from the vicinity of Tuxpeña.

The flora and ecology of Campeche are included in my treatise, *Preliminary Sketch of the Phytogeography of the Yucatan Peninsula* (Lundell, 1934).

Antedating the work of 1931–1932 in Campeche and Peten, I was Assistant Physiologist of the Tropical Plant Research Foundation of Washington, D.C., in 1928 and 1929, with headquarters at Honey Camp in British Honduras. Tapping experiments for the chicle industry on *Achras Zapota* L., and research on other promising gum yielding species were carried out in two seasons, June, 1928 to January, 1929, and July to November, 1929. During the spring interval in 1929 I was enrolled in Columbia University (Lundell, 1933b, 1975).

THE DISCOVERY OF CALAKMUL

The odyssey into southeastern Campeche and along the border of Peten, December 27, 1931 through January 11, 1932, was historic in that major archaeological discoveries were made which opened up a new era of exploration in an area not known to contain ruins of ancient Maya centers comparable to those of Peten in Guatemala. My report, (Lundell, 1932) and later, *Archaeological Discoveries in the Maya Area* (Lundell 1933a), covered the results of archaeological exploration of the region.

[1]Director, Plant Sciences Laboratory; and, Professor of Botany and Environmental Sciences, The University of Texas at Dallas.

The great Maya metropolis of Calakmul, which I discovered on December 29, 1931, one of the major metropolitan centers of the Maya, contains the highest of all Maya temples, and only Tikal rivals it in the number of stelae. Temple II at Calakmul, with its steep pyramid covering six acres at base and ruined temple on top, stands 176 feet high. Stelae at Calakmul are shown in figs. 16–20.

Much about my travels and work, and developments following the discovery of Calakmul and the other archaeological sites, remains to be reported. Shrouded in intrigue, that story is outside the scope of this paper.

With El Grillo, my helper, and a single pack mule, I left Tuxpeña early on December 27th, passed Konhuas, and proceeded eastward via bush trail to Rio Desempeño, arriving at 5 p.m. Overnight there, we left Rio Desempeño early on December 28th and headed south on the rough truck road for Central Buenfil, the chicle headquarters of Don Francisco Buenfil, the largest contractor in southeastern Campeche. Late that same day we reached Central Buenfil.

I rested and secured supplies the morning of December 29th, leaving Central Buenfil at 12:30 noon to explore ruins reported about 4 leagues south. After passing mounds over a considerable distance, we reached the center of the ruins in mid-afternoon. As we entered the main plaza

←

Fig. 16. Stela 41, Calakmul. A magnificent example of ancient Maya sculpture, Stela 41 is the finest and best preserved hieroglyphic monument in Calakmul. The figure, probably a high priest, carved in deep relief, stands on a captive. In his right hand he holds a lance, and with his left hand he grasps a shield.

Located on the west side of the base of Temple I (fig. 17, Pyramid A; and, Lundell 1933a, fig. 2), the limestone monument had fallen face forward, thus preserving its carving from the elements for over a thousand years. Bearing the Maya date 9.14.19.5.0 (Ruppert and Denison, 1943), it was erected in 471 A.D., according to the Morley-Spinden correlation. This was the apogee of the cultural development of Calakmul.

Only Tikal rivals Calakmul in the number of stelae. There are 103 in Calakmul, the greatest number found in any one city of the Maya civilization. At least 75 of these are sculptured. Calakmul has not only the greatest number, but also more sculptured stelae than any other metropolis of the Maya civilization. From the 51 Initial Series on its hieroglyphic monuments, identified by S. G. Morley (Carnegie Inst. Wash., News Service Bull., Vol. 2, no. 34, p. 239. 1932), 45 were deciphered. On the basis of the dates recorded, Calakmul flourished from 364 to 551 A.D. It was a metropolis of great size and importance for at least two hundred years.

My map of Calakmul, shown in fig. 17, shows Stela 41 on the west side of Temple I (Pyramid A, Lundell, 1933a, fig. 2). The stelae of my map were renumbered on the map of the city published by the Carnegie Institution of Washington (Ruppert and Denison, 1943, pl. 61). Stela 41 of Lundell, its discoverer, is renumbered Stela 51 by the Carnegie Institution of Washington authors on their 1943 map, pl. 61, l.c.).

of what was at once evident as a major Maya metropolis, a faisán (turkey-size game bird) fell fluttering to the forest floor in front of my mule, its throat slashed, probably by a startled ocelot who dropped its prey on seeing us. Nevertheless, to me it was an omen of welcome from spirits of old. We barbecued the bird for dinner.

Camp was made in the main plaza, and preliminary exploration started by using a compass in cutting a north-south trail through the forest covering the ruins. On December 30th exploration of the ruins was undertaken, covering initially an area of several square kilometers of well laid out temples, courts, a standing structure, and countless mounds of various heights of structures long fallen into ruin. December 31st was given over to photography, mapping the site from the base trail, and recording the locations of the stelae, fig. 17. Exploration of unending outlying groups of mounds continued on January 1st until noon, when we packed up reluctantly to return to Central Buenfil. On January 2nd we rested. The name, Calakmul, was selected for the metropolis. The city of the "two great pyramids" is a literal translation of the name.

My guide, who joined us at Central Buenfil, was Jesus Garcia, a very able sinewy veteran of the *chiclero* trails, and head *arriero* of the Buenfil chicle operation, which covered southeastern Campeche from Rio Desempeño on the north, to the Peten border southward, and westward almost to Esperanza.

On January 3rd we departed from Central Buenfil and proceeded southeast toward Villahermosa, passing substantial ruins with standing structures along the way, arriving at our destination at midnight after a nightmarish experience crossing the final two miles of the Bajo de Calakmul. It took six hours for us to take our mules through the belly deep mud. January 4th was spent at Villahermosa resting from the ordeal of the night before, and inspecting chicle operations. Early on January 5th we left Villahermosa and headed through high forest for ruins reported to the south, unknowingly crossing the Guatemala border. We arrived at this site, covered with huge *ramon* trees, another tremendous Maya city, called Naachtun (Nohoxna), which sits on the upland above the *bajo*. The ruins were explored, photographed and mapped on January 6th and 7th (Lundell, 1932, 1933a). At this old site I discovered 8 stelae (Lundell, 1933a, figs. 6 and 7).

Game and wild animals abounded at Naachtun, and animal eyes gleamed at night in a circle around our camp fires, and monkeys chatted in the trees about us. We broke camp on January 8th, our pack animals loaded with barbecued faisán and turkeys. We headed back to Villahermosa which we reached at mid-afternoon. The next day we left Villahermosa early, arrived at the Ciriaco chicle camp at noon. On the way we passed the La Fama campsite, the site of a massacre in which only my guide, Jesus Garcia, lived to tell the tale. *Chicleros* from Peten and Campeche had fought to the death with guns and machetes.

That day an old Maya site of some significance was discovered, which I named *Pared de los Reyes* after a stucco frieze along the sides and end of a roof comb still standing amidst the ruins (Lundell, 1933a).

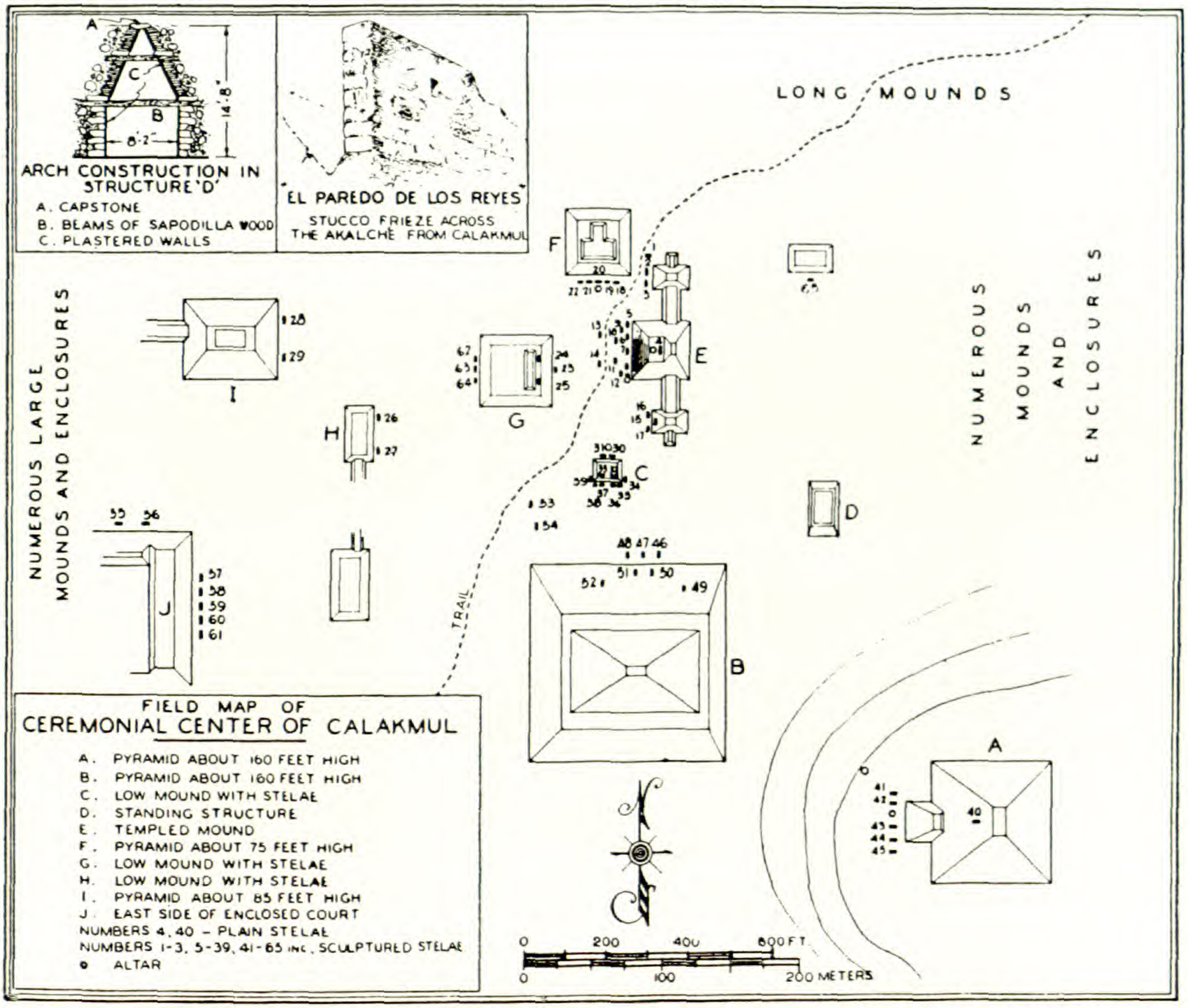

Fig. 17. Calakmul, Map of Center of City (Lundell, 1933a, fig. 2). The locations of the monuments, stelae and altars, which I recorded, are shown. The two great pyramids, for which the metropolis is named, Pyramid A and Pyramid B, support Temple I and Temple II, respectively.

S. G. Morley, in his letter to me from Chichen Itza, dated May 20, 1932, made a report on the Carnegie Institution of Washington expedition to Calakmul, and of the map he stated (from pages 3 and 4):

> "Sunday, April 10th, with your maps in hand, we set out to locate your sixty-four stelae, and the buildings with which they were associated.
> "In the first place, Lundell, we all found your map simply invaluable. It probably saved us a good week in locating all the monuments, and permitted everybody to get to work on his own line of investigation the second day after we got there. I had four copies of the map made, and we each of us had one, Ruppert, Bolles, Stromsvik and myself. .....Our collective hats are certainly off to you, Lundell. Your map ticked like a perfect chronometer, and we located every one of your stelae save one.....a damed high batting average."

Since I could spend less than three days at the site, and had only two native helpers to cut trails and clear bush, not all of the stelae, or any of the outlying structures, could be mapped. This accounted for the fact that Morley and his associates found thirty-four additional stelae in the area covered by my map, fig. 17.

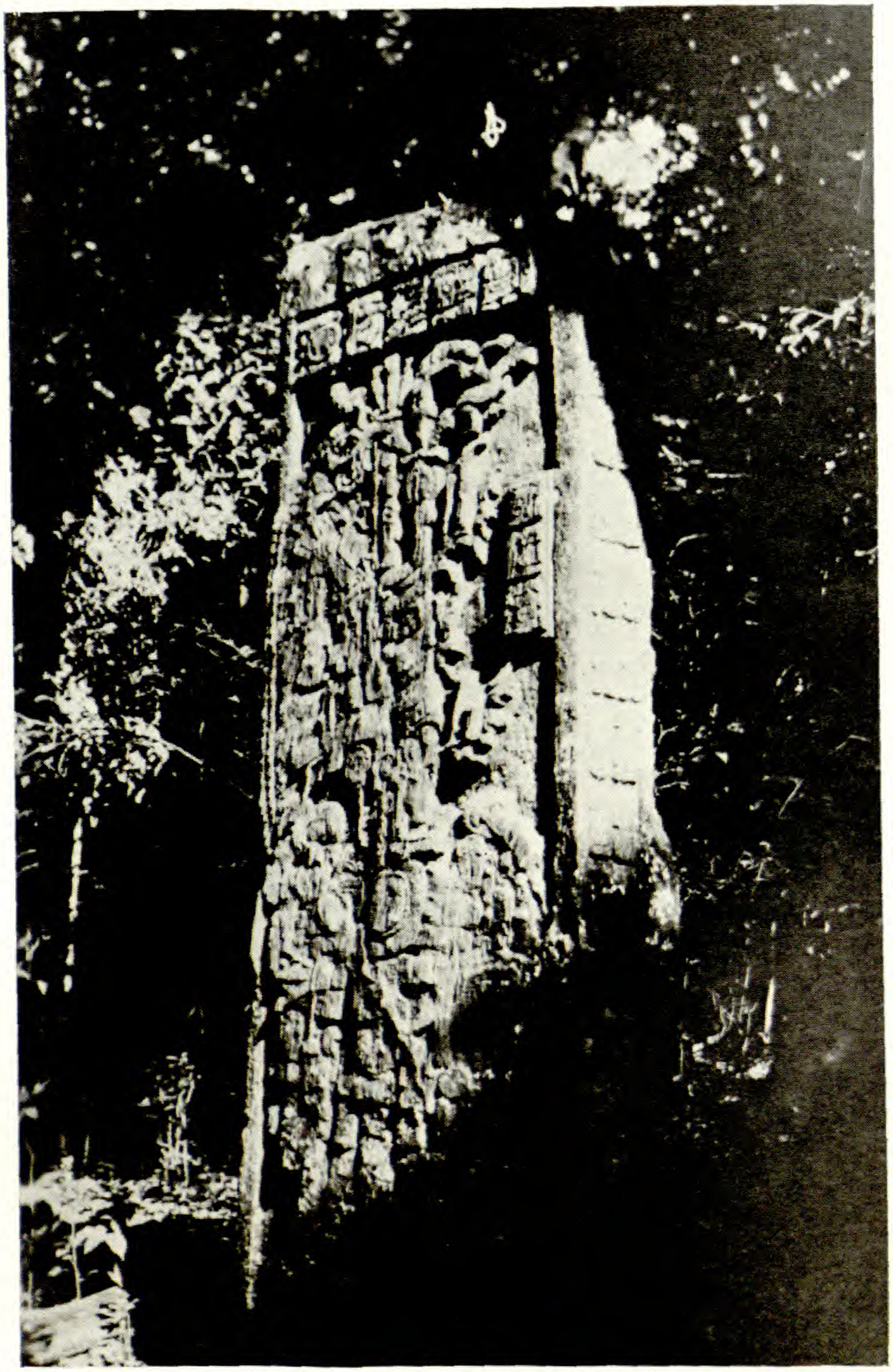

Fig. 18. Stela 42, Calakmul (fig. 17; and, Lundell, 1933a, fig. 2). This is Stela 52 of Ruppert and Denison (1943, pl. 61). Seven stelae were erected at base of Temple I (fig. 17, Pyramid A), all on the same Maya date, 9.15.0.0.0, or 471 A.D.

Fig. 19. Calakmul, stelae standing in felled forest. This site was covered by a dense forest dominated by the *ramon* tree, *Brosimum Alicastrum* Sw. It is possible to pass within a few feet of a structure, or a standing or fallen monument, without seeing it through the dense vegetation.

Fig. 20. Stela 5, Calakmul, below (fig. 17; and, Lundell, 1933a, fig. 2). This is Stela 9 of Ruppert and Denison (1943, pl. 61). A black slate monument carved on all four sides, this monolith, originally eleven feet high, had broken off below center. Stela 5 is dated 9.12.0.0.0, or 412 A.D. According to reports received, the monument has been moved from Calakmul to a museum in the City of Campeche.

CARTA NOCTURNA de CAMPECHE a ANDOVER, MASSACHUSETTS, EE. UU.

April 28 de 1932.

DR. A. V. KIDDER,
PHILLIPS ACADEMY,
ANDOVER, MASSACHUSETTS, U.S.A.

REACHED CIVILIZATION THIS MORNING STOP CALAKMUL EXCEEDED WILDEST EXPECTATIONS HAVING MANY MORE SCUBPTURED MONUMENTS THAN ANY OTHER CITY MAYA AREA MANY DATED AND A FEW OF HIGH ESTHETIC MERIT STOP ALL WELL EXCEPT KARL WHO HAD SHARP ATTACK MALARIA LAST DAY STOP WILL WRITE FROM CHICHENITZA STOP FOLLOWING MESSAGE BEING SENT TO MEXICAN GOVERNMENT TONIGHT QUOTE DICIEMBRE VEINTE Y NUEVE ULTIMO C. L. LUNDELL JOVEN BOTANICO NORTEAMERICANO DESCUBRIO SUR ESTADO CAMPECHE UNA CIUDAD DE GRANDE EXTENSION DEL IMPERIO VIEJO DE LOS ANTIGUOS MAYAS, SENOR LUNDELL HIZO UN MAPA PROVISIONAL Y DESCUBRIO SESENTA Y DOS MONUMENTOS ESCULTURADOS SENOR LUNDELL CON GENEROSIDAD NOTABLE PUSO TODAS SUS NOTAS Y SU MAPA A DISPOSICION DE LA CARNEGIE INSTITUCION DE WASHINGTON, LA CUAL HA ESTADO HACIENDO EXCAVACIONES EN CHICHENITZA POR LOS ULTIMOS OCHO ANOS. ABRIL TRES SALIO DE CHICHENITZA UN GRUPO DE LA DIRECTIVA DEL PROYECTO CHICHENITZA DE DICHA INSTITUCION PARA EXPLORAR LA CIUDAD DE CALAKMUL Y HOY REGRESO A CAMPECHE DESPUES UNA PERMANENCIA DE UNA QUINCENA EN ESTAS RUINAS. COMO RESULTADO ESTA EXPEDICION HA COMPROBADOSE QUE CALAKMUL ES UNA DE LAS PRINCIPASES CIUDADES DEL IMPERIO VIEJO MAYA. TIENE EL TREMENDO TOTAL DE CIENTO TRES MONOLITOS ESCULTURADOS CON FIGURAS Y GEROGLIFICOS. TIENE CINCUENTA Y UNA SERIES INICIALES DE LAS CUALES LA EXPEDICION PUDO DESCIFRAR LAS FECHAS DE CASI LA MITAD. DICHA EXPEDICION HIZO MAPA TECNICO ENDONDE ESTAN LOCALIZADOS TODOS MONOLITOS, EDIFICIOS, ETCETERA. HIZO ESTUDIOS ARQUITECTONICOS, CERAMICOS Y ESPIGRAFICOS. EXPEDICION LLEGO CAMPECHE HOY REGRESARA CHICHENITZA MANANA. UNQUOTE. AFFECTIONATELY.

Sylvanus G. Morley.

Fig. 21. Telegram sent by S. G. Morley to officials of the Carnegie Institution of Washington and Mexican Government reporting results of the Calakmul expedition, April 3–28, 1932.

The next morning we left the Ciriaco camp early for the Chacon camp, arriving for lunch. That afternoon we followed the trail to the Vila camp where I spent the night. Jesus Garcia took leave for Central Buenfil, and I took the bush trail westward to Esperanza. After lunch there I headed south for Tuxpeña which I reached about 5 p.m., covering over fifty miles by mule-back the last day. The whole odyssey took only sixteen days, but it opened up a new world to archaeologists, and provided valuable data for my studies of the vegetation of the Yucatan Peninsula. And it provided the chicle industry with a graphic report on operations in that region.

My photographic negatives for the trip were sent to the Mexican Exploitation office in Campeche for developing. Mr. J. C. Brydon, the manager, had a set of prints made for himself, without my knowledge, which he took with him to New York. On the boat from Progreso to New Orleans, he showed these prints to Dr. John C. Merriam, President of the Carnegie Institution of Washington. This led to the subsequent exploration of my sites by S. G. Morley and his associates.

In April, 1932, Dr. S. G. Morley headed an expedition of the Carnegie Institution of Washington to Calakmul, and subsequently issued a press report on this, *Calakmul – A Recently Discovered Maya City* (Carnegie Inst. Wash., News Service Bull., Vol. 2, no. 34, Aug. 14, 1932). After his return to Campeche from the expedition, he sent a telegram reporting on the Calakmul trip to the Carnegie Institution of Washington and the Mexican Government, fig. 21.

Dr. S. G. Morley in his letter to me from Chichen Itza, dated May 20, 1932, reporting on results of the expedition, wrote:

"Turning next to the chronological aspects of the site, a great surprise awaited me. The dates (Maya) run from 9.9.10.0.0 to 9.19.0.0.0, but instead of erecting a single monument for each hotun ending, the ancient Calakmuleños did the thing in the grand manner; sometimes two, three, and in one place even seven stelae were erected at the end of a five year period. This last is true of the beautiful monuments up at Structure A (Temple I), seven of which were erected in 9.15.0.0.0. This particular katun ending, by the way, is the esthetic apogee at Calakmul. I should say that the city was at the very height of its material prosperity and its artistic development at this time, and there is no question but that some of the seven monuments erected at this period ending will rank among the finest examples of Old Empire sculpture that have come down to us."

Subsequent expeditions explored Calakmul and additional sites, several of which, Alta Mira in particular, I had reported (Lundell, 1933a, fig. 1). The account of these is contained in *Archaeological Reconnaissance in Campeche, Quintana Roo, and Peten* (Ruppert and Denison, 1943).

It was not possible to take more than a few plant specimens in the single press I carried on the southeastern Campeche trip to Calakmul, Central Buenfil, Villahermosa, Naachtun, La Fama and at other stops along the trails. Time and facilities were too limited, but I made notes on the vegetation. Back at Tuxpeña, I prepared a detailed (unpublished) report on the trip covering in detail the chicle operations in the region

and a summary of forest conditions. On January 12th I resumed plant exploration in the vicinity of Tuxpeña, and continued this work through February 23rd.

Orders from Campeche to me at Tuxpeña to cancel the trip, which had been authorized, arrived after my departure on December 27th for southeastern Campeche. The Great Depression made cutting expenses a top priority, so the odyssey, by a stroke of fate, came off because of a delay in the mails! Thus history is made.

TUXPEÑA

Tuxpeña, the southern Campeche office of the Mexican Exploitation Company, had been a center of chicle operations for decades (figs. 22–24). Originally more than a thousand acres of upland forest *(zapotal)* and swamp forest *(akalche, bajo)* had been cleared for pasture land and corn production by Mr. P. W. Shufeldt. Most of this had been overgrown by 1931, some having been recleared and planted several times.

In the cleared upland forest at Tuxpeña, areas have been observed which appear to have been laid off by stones as if the Maya had surveyed and systematically divided it up into fields. Enclosed dooryard plots are common in Mayan villages, and small production plots are protected in the area of their *milpa* clearings. These are important to the food supply. However, the marking off of field-size areas may have indicated

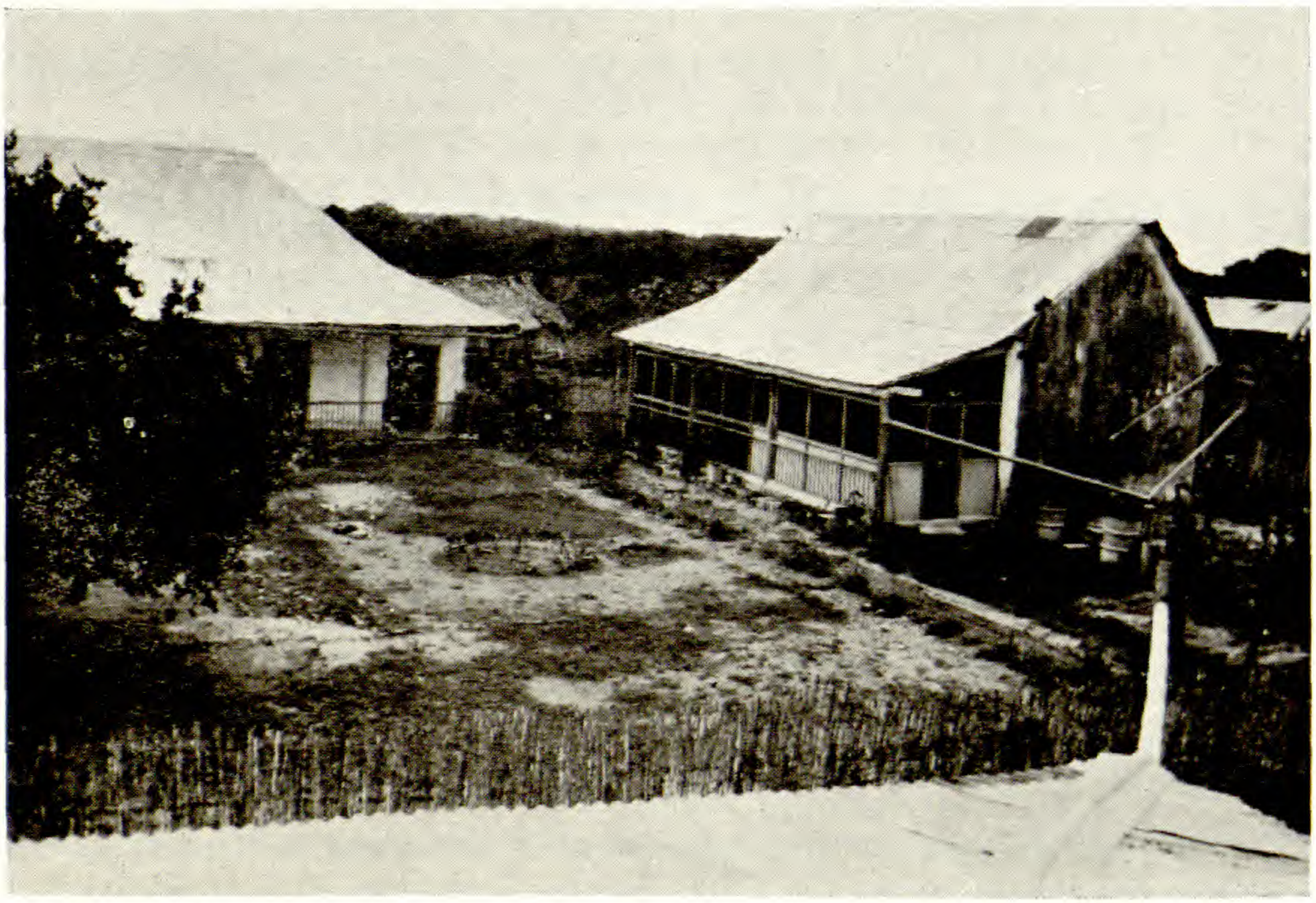

Fig. 22. Tuxpeña, Campeche. Headquarters of the Mexican Exploitation Company, the office building at left, the living quarters with screened porch on right. A stone marker in courtyard, probably erected by P. W. Shufeldt, bears the date 1913.

an intensive agriculture on a much wider scale, as population pressure increased, and land was assigned for production. I reported this in *Agriculture of the Maya* (Lundell, 1933c). In recent years geographers have found the observations about field demarcations around Tuxpeña of interest.

I often visited Konhuas, a Maya village near Tuxpeña. Konhaus was typical of the larger Maya villages, having a government-maintained school and central plaza (figs. 25 and 26). It was a strong agricultural community largely self-sustained. Clearing by the Maya of Konhaus for their shifting agricultural fields *(milpas)* contributed to the widespread second growth forest around Tuxpeña.

Headquarters of the chicle operations of the brother of Don Francisco Buenfil, Chan Laguna was a typical Maya village located on the banks of a small shallow lake west of Tuxpeña. Of its nine families, eight lived on the products of their *milpas*. Each family had its bush house, a structure consisting of only one large room. The walls of the houses were of poles, and through the spaces between these, the air circulated freely. Windows were uncommon, and there were only two doors. The roof was thatched with palm leaves. At one end of the hut there was a place on the dirt floor for an open fire for cooking. The beds, as well as the other furnishings, were made of small poles. There were wooden boxes used as chairs. Each Indian had a few metal pots, but most of their utensils were made from gourds which they planted in their *milpas*. They did not use knives, forks and spoons. All of them had the necessary mosquito nets and blankets.

In the late autumn of 1931 when I visited Don Laureano Xehe, the oldest and most interesting Indian in Chan Laguna, he welcomed me heartily to his hut. When I entered with his son, he was sitting on the ground beside the fire stirring a pot of beans. He rose and shook hands. His small black eyes sparkled as he bade me take a seat beside him. He spoke only Maya so his son speaking Spanish acted as interpreter.

Fig. 23. Tuxpeña, Campeche. Chicle warehouse with incoming pack mules loaded with burlap bags filled with blocks of chicle gum.

Fig. 24. Wild turkeys on stone marker in courtyard at Tuxpeña. In the interior wild game is the chief source of fresh meat, a necessary supplement to the three-meal-a-day diet of fried beans, rice, eggs and tortillas.

Fig. 25. Konhuas, a Maya village near Tuxpeña, with men dressed in typical white cotton shirts and pants.

Fig. 26. Konhuas, the thatched-roof school building, with a beautiful *Flor de Mayo* tree, *Plumeria rubra* L., in foreground.

It was said that he once had a complete hand-loom and other tools used by his wife to spin their cloth. I begged him to let me see them. His wife had been dead for years, so he did not recall what had become of these tools. He searched among some of his old relics, and finally found a set of spindles and a ball of hand spun thread in an old straw basket. The spindles were still coiled with cotton thread, fig. 27.

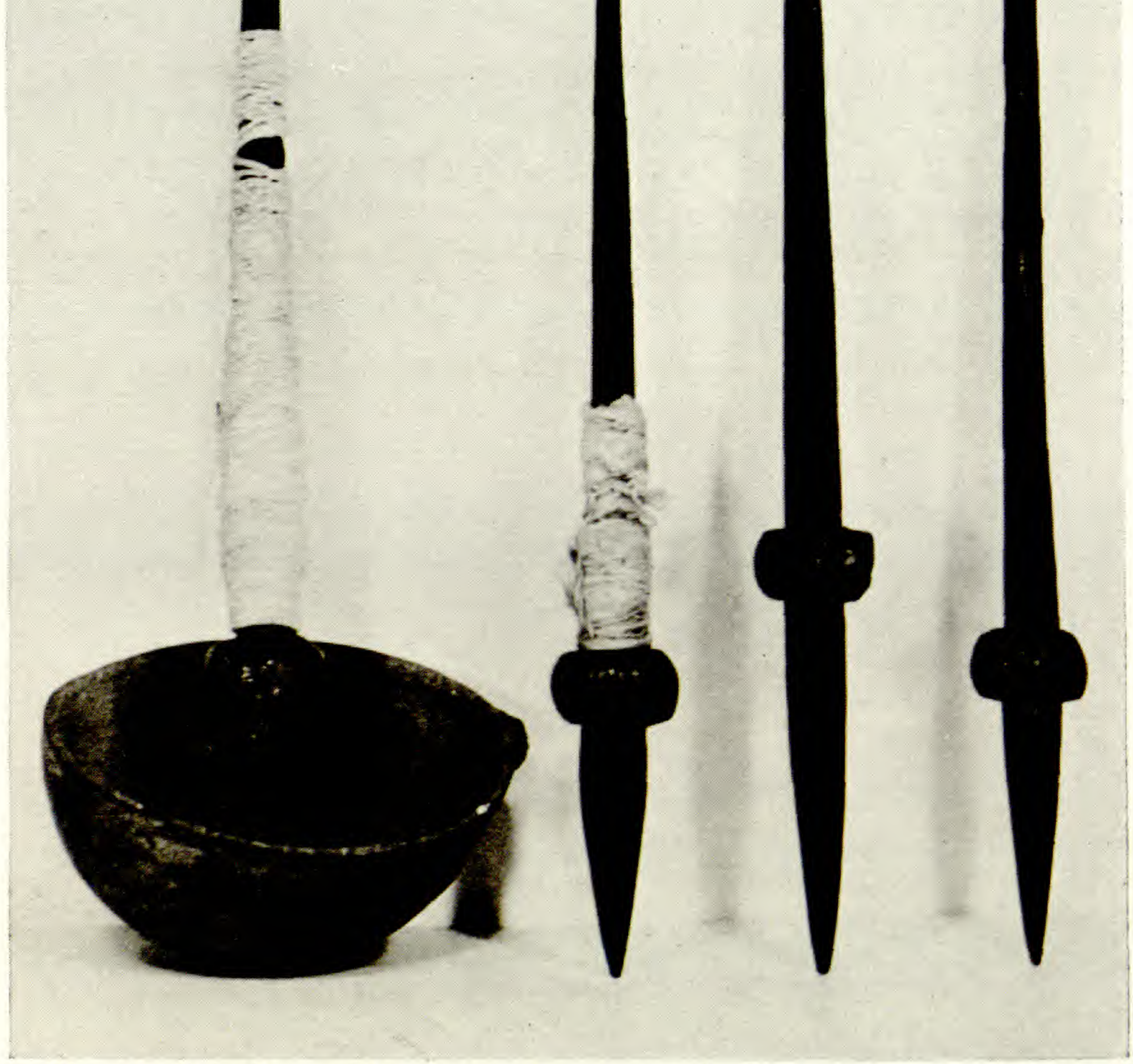

Fig. 27. Spindles, with cotton thread attached, about one-half natural size, gift from Don Laureano Xehe of Chan Laguna, Campeche.

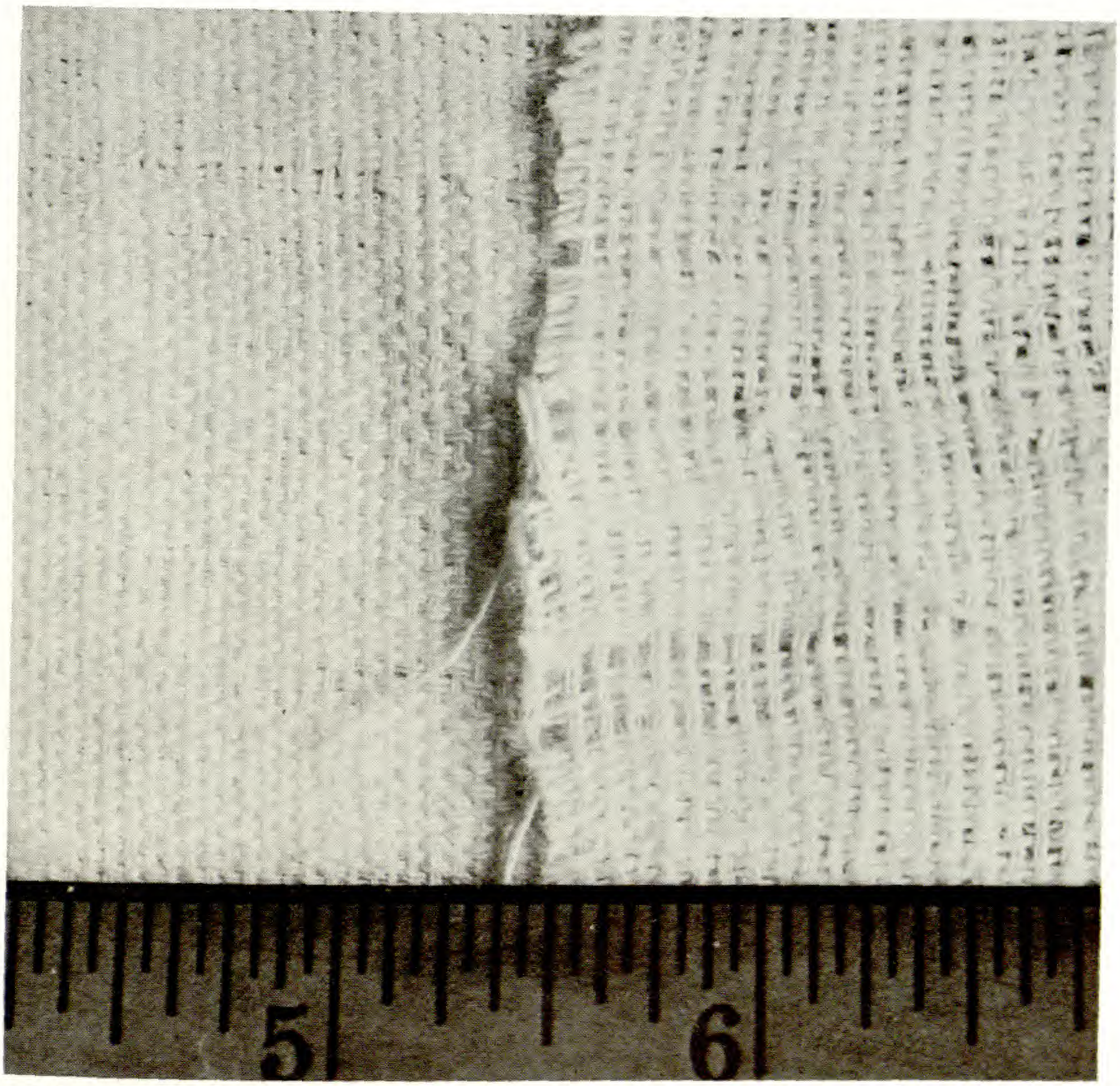

Fig. 28. Samples of hand woven cloth from Maya village of San Andres, Lake Peten Itza, Peten.

Don Xehe had made looms years ago, so later he reconstructed one and sent it to Tuxpeña. In exchange, I sent him ten yards of cloth as a gift for he would not accept money.

Don Xehe had just returned from his *milpa* shortly before I visited him. It was harvest time, so his hut was filled with produce. There were large pumpkins stacked in a corner. A table was covered with plantains and bananas. There were two large baskets filled with corn. Black beans, still in their shells, were being bound in small bundles. These bundles were wrapped with dried plantain leaves, and suspended from the rafters along with the garlic, peppers, onions, and dried tobacco leaves.

Besides his *milpa,* Don Xehe had a horse, six hogs, chickens and turkeys. He had a mahogany dugout, and at night he and the other Indians would go out on the lake to spear fish. His was a completely self-sufficient existence for he had no needs except for a little cloth, and this he could obtain by selling some of his produce, corn in particular (Lundell, 1933c).

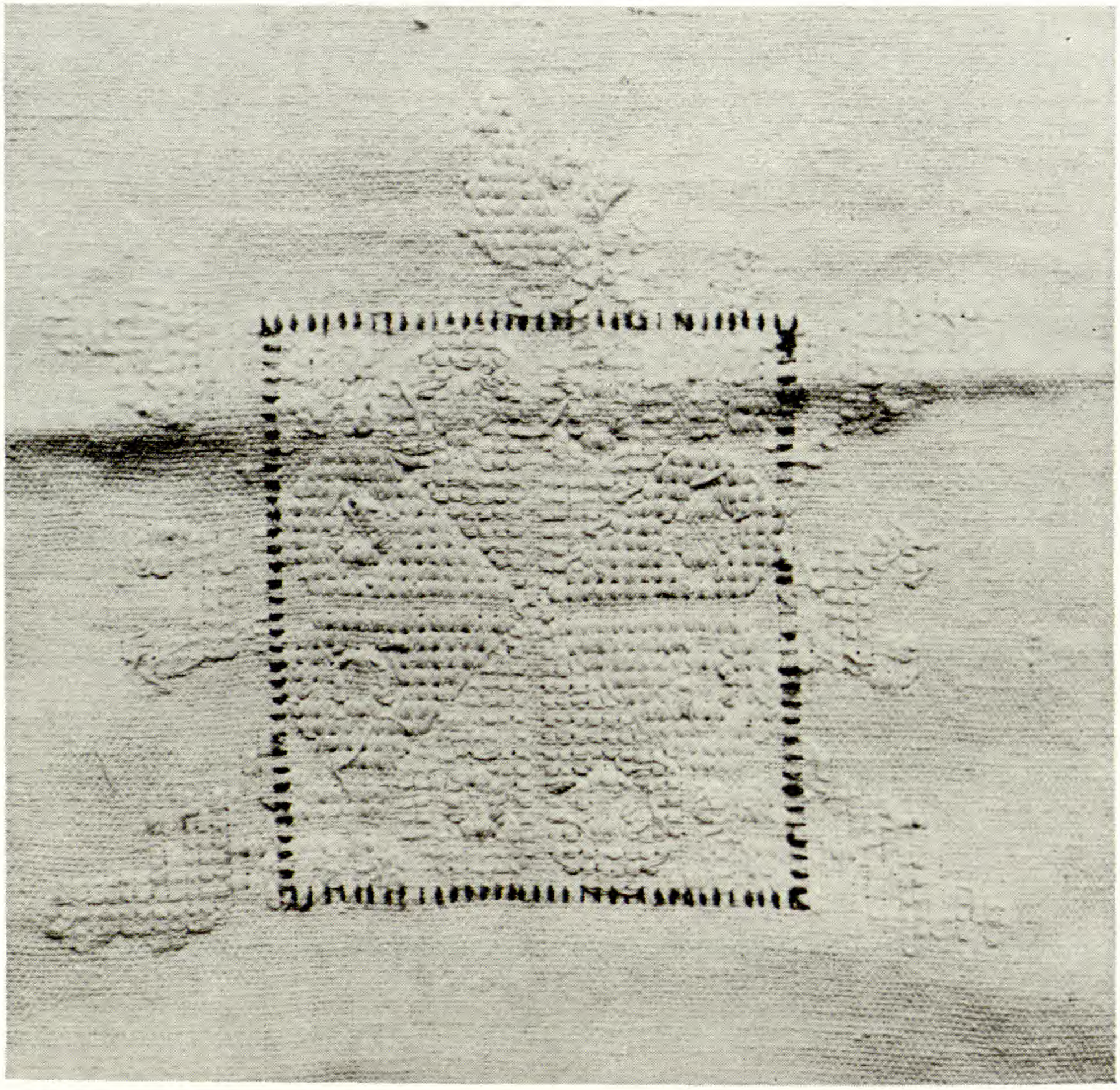

Fig. 29. The design in center of cotton altar cloth from Maya village of San Andres, Lake Peten Itza, Peten. The cloth, woven in three 10 inch panels, hand sewed together, is about 30 inches square, bordered with a 2 inch fringe.

Since my tourist card was soon to expire, my transfer from Tuxpeña, and out of Mexico, became a necessity. I left for the City of Campeche, retracing my inland trip of the past October, traveling by muleback via Konhuas and Xbonil to La Gloria (Juarez), where I rode the old logwood cutters tram-line to Kanasayab on the Champoton River. From there I obtained passage by boat to Champoton, and up the coast to Campeche.

After a short stay in Campeche at headquarters, awaiting instructions from New York, I visited Merida, Uxmal and Chichen Itza. At Chichen Itza I met with Dr. S. G. Morley on March 5th to give him my field notes and the map of Calakmul. He tried to arrange for me to accompany him on the April expedition of the Carnegie Institution of Washington to Calakmul, but that was not to be.

After the visit to Chichen Itza, I returned to Campeche, and made a trip by truck into the Los Chenes country to the east where I visited Cibalchen between the 10th and 13th of March, 1932. I collected plants at Konchen and Cibalchen, including the type of *Croton campechiana* Standl. Returning to Campeche headquarters I made plans for leaving Mexico, for instructions had come from New York for my reassignment to the Guatemala headquarters of the Chicle Development Company at El Paso de Caballo in Peten on the San Pedro de Martir River.

From Campeche the two routes to El Paso de Caballo, Peten are by water along the coast, and then up the Usumacintla and San Pedro de Martir rivers, or overland by trail via Tuxpeña and Esperanza. Since the latter route would afford an opportunity to make a north-south transect of the great forest from Tuxpeña into central Peten, I chose the latter.

Also, I was now facing a decision about my career.

Returning to Southern Methodist University in 1930, after my 1928 and 1929 association with the Tropical Plant Research Foundation, I resumed undergraduate studies. On February 1, 1931 I reported to the New York office of the Chicle Development Company and worked there from February through August, 1931, where I was given orientation in the commercial aspects of the chicle industry. During that summer I attended night school in the Graduate School of Business Administration of New York University on Church Street.

Professor H. H. Bartlett, botanist of the University of Michigan – Carnegie Institution of Washington biological expedition into British Honduras and northern Peten in 1931 (Bartlett, 1932), whom I had corresponded with from Tuxpeña, urged me to come to the University of Michigan for graduate work, where I could continue my botanical studies of the Maya area. I was promised an assistantship in the Botanical Gardens of the University of Michigan. Concurrently, Dr. S. G. Morley was offering to arrange for my association with the Carnegie Institution of Washington to continue archaeological work under the Institution as a member of its staff. A scholarship to Harvard University was assured by Dr. Morley if I would choose an archaeological career!

THE END OF THE ODYSSEY

On March 22nd I returned to Tuxpeña from the City of Campeche, retracing my earlier route by boat, tram-line and muleback. On March 24th I headed south by trail for Peten (Lundell, 1933a). It was essential that we carry all necessities for a trip through this uninhabited forest, so I took provisions for six days of travel, extra food, corn for the mules, and the usual equipment such as tarpaulins, hammocks, mosquito nets, blankets, axes, lamps, pots for cooking, and a medical kit. These, along with my plant presses and driers, and personal baggage made up full loads for six pack mules. An *arriero* (muleteer) who had been over the route before to El Paso de Caballo was hired for the trip, along with a helper.

From Tuxpeña we headed south, and the first day, traveling slowly with the pack mule train, we reached Esperanza. Early the next morning, March 25th, we set out for San Felipe, the site of an abandoned village, as our destination. The trail was almost closed by encroaching vegetation, but as there had been some chicle traffic, it was passable, even though we had to cut our way around fallen trees.

During the day we passed through Chun Cruz, an infamous *bajo* (wooded swamp), which is said to have claimed the lives of more pack mules than any other *bajo* in the chicle country. The place was named for an *arriero* who lost his life trying to bring a mule train through it. We passed easily for it was the dry season.

Late in the afternoon we reached San Felipe, and camped beside the *aguada* (water hole). The next day, March 26th, Easter Sunday, we left at sunrise. From San Felipe, no one had passed that way with mules for several years, so it was with difficulty that we followed the trail. We were now in the borderland of the high forest of Peten. Cuts on trees and other evidences of man's passage were often the only trail markings. At noon that day we came to a vine-covered stone monument, the boundary marker between Mexico and Guatemala. Except for this marker, there was no way to tell that we were passing from one country into another for it was one continuous forest. From San Felipe we rode three days before reaching our destination, El Paso de Caballo, where I presented my papers to the Guatemalan official!

South of the Mexican border we crossed the narrow Paixban River, and that night stopped at an abandoned *chiclero* camp for the night. The next day, March 27th, we passed through another *bajo* which was muddy and made progress slow and tiring. That day at dusk we reached Isabelita, a chicle station of the Chicle Development Company. That night I ate a never to be forgotten meal at which monkey meat was served. It tasted like young veal to a hungry traveler.

The next day we rode hard from dawn to dusk through the great three-tiered forest. Leaves of tall cohune palms arched the way, and mahogany giants, sapodilla, *ramon*, and other towering trees darkened the forest floor in perpetual shade. Some of the tall forest resembled an arched cathedral ceiling. The undergrowth was sparse.

Late on March 28th we reached El Paso de Caballo on schedule, without mishap, having covered an estimated thirty-five miles daily by meandering trail. I reported upon arrival to the local manager of the Chicle Development Company, Mr. Mosey Adams.

Along the way from Tuxpeña, I collected a few plant specimens at Esperanza, San Felipe and at Isabelita.

My days in the employ of the Chicle Development Company were numbered, and my stay at El Paso de Caballo lasted less than a month. While there, with few official duties, I undertook vegetation studies, and collected 215 numbers of plants in that vicinity and along the trail on the outward trip to Belize.

At Tuxpeña, and again at El Paso, I made zoological collections — mostly fish, lizards, snakes and amphibians. These were deposited in the Museum of Zoology of the University of Michigan. New or otherwise

interesting fish which I caught in the San Pedro de Martir River inspired Dr. Carl Hubbs, of the University of Michigan Museum of Zoology, to organize an expedition into Peten in 1935.

On April 28th I left El Paso by muleback headed eastward through Peten for Belize in British Honduras, homeward bound after seven months of wandering in the wilderness. Married on Jan. 15, 1931 before taking the job on February 1st in New York, my wife had joined me there in June, but my departure in September for Mexico, for the long absence in the jungle, had been a personal ordeal for both of us.

The first night after leaving El Paso was spent at Laguna Perdida, the former chicle headquarters of Mr. P. W. Shufeldt, now completely in ruins. I collected a few plant specimens, and also visited the crumbling tomb of Mrs. P. W. Shufeldt, who had died there.

On May 1st I entered the savanna country of central Peten for the first time, a striking different physiographic area, Cretaceous in age, with alternating low forested ridges and open grasslands, figs. 30 and 31.

Collections were made in the savanna along the trail to Chiche, where we stopped for the night. The next day, traveling through savanna country, we reached San Benito at the western end of Lake Peten Itza, a magnificent body of deep fresh water.

After a visit to Flores, the next day at noon we left by motorboat (dugout) for Remate at the east end of the lake. Our *arriero* had taken the mules around the lake by land, so they were waiting for us when we arrived.

From Remate we reached the border of British Honduras in two days of hard riding, passing through high forest nearly all the way. Yaxha was our stopping place the first day, and late in the afternoon of the second we cleared customs at Fallabon, and crossed the border, proceeding by muleback to Benque Viejo, and then hired an old Ford for the ride to El Cayo. The colorful trip by riverboat down the Belize River from El Cayo to Belize was made without incident, fig. 32.

I had visited El Cayo in the Summer of 1929 in a trip overland from Hillbank, having gone up the New River from Orange Walk, near Honey Camp. I was now in familiar country (Lundell, 1933b).

After the odyssey of 1931–1932, I completed my undergraduate studies at Southern Methodist University during the summer, graduating in August, 1932. Accepting the offer of the University of Michigan, I entered graduate school in Ann Arbor in September, 1932, studying botany under Professor H. H. Bartlett, and archaeology under Dr. C. E. Guthe, a Maya scholar, and Director of the University Museums.

The 1931–1932 exploration in Campeche and Peten led to the organization of the 1933 Biological-Archaeological Expedition of the University of Michigan-Carnegie Institution of Washington to Peten. I was appointed Research Associate of the Carnegie Institution of Washington, serving under Dr. A. V. Kidder, Chairman of the Division of Historical Research, and continued as Assistant in the Botanical Gardens of the University of Michigan under Professor Bartlett.

Fig. 30. The savanna country of central Peten, Guatemala, near the village of Chiche. I was accompanied by two helpers and a pack mule.

Fig. 31. Another view of the savanna country of central Peten, a Cretaceous area extending into Peten eastward from Chiapas, Mexico.

Fig. 32. Riverboat on the Belize River. Without a road to the coast in 1932 this was the only means of transportation, except by muleback, from El Cayo to Belize. The boat stopped to make deliveries and pick ups at most settlements along the riverbank. The trip was a leisurely one. Resting in a hammock slung between posts below the upper deck, the whole jungle kaleidoscope passed in view. Going up river, winches were used during low water periods to pull the boat over shoals, but going down stream, poles usually were sufficient to push the boat along.

The botanical and archaeological results of the 1933 expedition, which I headed as Director and Botanist, are reported in two publications, *The Vegetation of Peten* (Lundell, 1937); and, *Ruins of Polol and Other Archaeological Discoveries in the Department of Peten, Guatemala* (Lundell, 1933d).

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CHICLEA, A NEW GENUS OF GUM YIELDING TREES IN THE SAPOTACEAE

Cyrus Longworth Lundell

In the study of the Sapotaceae of Guatemala and adjacent areas, generic limits are being reexamined. An attempt has been made through field work to obtain collections of representative material of the taxa. In spite of all efforts, too many species are represented by single collections, some sterile, others with only flowers or fruits.

The Sapodilla-Nispero complex of genera and species, the sources of chicle, and the inferior gums still produced in commercial quantities, offers a challenge. *Manilkariopsis* (Gilly) Lundell, has been elevated to generic status (Wrightia 5: 172. 1975). Another segregate, *Chiclea*, is proposed with the recognition of three species, *C. staminodella* (Gilly) Lundell, and two others undescribed.

The peculiar staminodia of *Chiclea*, together with distinctive seed, well-mark the genus. In *Chiclea* the staminodia are thick, fleshy, strongly inflexed (like a thumbless folded hand), short, usually wider than long, subtruncate at the erose-dentate apex, and densely pubescent on the exterior surface. By contrast, the staminodia of *Achras* and *Manilkariopsis* are petaloid, erect, thin, of the same texture as the petals, with apex subentire, bifid or lacerate.

The seed of *Manilkariopsis petenensis* Lundell, the only available for that genus, are subtruncate-rounded at apex, acutish at base with minute but conspicuous dorsal fold. Oblong-obovoid in *Manilkariopsis*, the seed are obliquely ellipsoid in *Chiclea*, rounded at apex and obtuse at base, without a dorsal fold. In populations now referred to *Achras*, the seeds are variable, but differ from the types known in *Chiclea* and *Manilkariopsis*.

Manilkariopsis and *Chiclea* have 3-lobed petals with lobes united at middle at least one-third of length. (In this study I use petals for the traditional "corolla lobes" in gamopetalous flowers to avoid the redundant terminology of lobed lobes, or appendages, of authors!) In *Achras* the petals are not 3-lobed, but vary at apex from entire to dentate to erose.

Chiclea Lundell, gen. nov. — Arbores lactescentes; folia ad apices ramorum conferta, alterna, coriacea vel chartacea, petiolata, dense pennivenia; flores hermaphroditi, ad axillas foliorum solitarii, geminati vel fasciculati, pedicellati, lenticellati, tomentelli; sepala 6, raro 4 vel 8, biseriata, imbricata; corolla gamopetala, suburceolata vel campanulata, tubo lato; petala 6, 3-lobata, ca. ⅓ connata, lobis lateralibus oblique ovatis vel lanceolatis, imbricatis, lobo medio spatulato vel anguste elliptico; stamina 6, tubo corollae affixa et lobis interioribus opposita, filamentis brevibus liberis; antherae lanceolatae, extrorsae, thecis 2, longitudinaliter dehiscentibus, connectivo saepius ultro loculos apiculato; staminodia 6, carnosa, inflexa, parva, subtruncata, eroso-dentata, extus pubescentia; discus carnosus, lobulatus, hirsutus; ovarium hirsutum, 6–11-loculare; stylus cylindraceus, glaber, stigmate parvo, minutissime lobulato; bacca carnosa, ovoidea vel subglobosa; semina pauca, oblique ellipsoidea, subcompressa, apice rotundata, basi obtusa, testa crustacea;

hilo lineari, basilaterali; albumen carnosum; cotyledones planae.

Type species: *Chiclea guatemalensis* Lundell.

Chicle is the gum of commerce produced from trees in the Sapodilla-Nispero complex, whence the generic name, *Chiclea*.

Since the first species described in this complex, *C. staminodella*, is known only from *Schipp 1310*, the type collection, and the material is poor, I have selected *C. guatemalensis* as the generic type. Excellent flowering and fruiting specimens of this species are represented in collections from Guatemala and Belize.

Key to Species

1. Leaves small, thin, subchartaceous, elliptic or oblanceolate-obovate, widest at or above middle; inner sepals oblong-oblanceolate, 3.5-4 mm. wide above middle, narrower below, apex subtruncate and apiculate; lateral lobes of petals narrow, obliquely lanceolate, up to 2 mm. wide, scarcely overlapping at middle .... 3. *C. staminodella*
1. Leaves larger, subcoriaceous, lanceolate or oblong, widest at or below middle; inner sepals broadly ovate or elliptic, at least 6 mm. wide, apex acutish; lateral lobes of petals wide, obliquely ovate or broadly elliptic, 3.5–4 mm. wide, strongly overlapping at middle (2).
2. Pedicels 2.5–3.5 mm. long, straight, equalling or longer than petioles; sepals small, about 7 mm. long; corolla about 8.5 mm. long; ovary 7-loculate ..... 2. *C. excelsa*
2. Pedicels 1–1.5 cm. long, mostly recurved, about half as long as petioles; sepals large, 8–10 mm. long; corolla 8.5–12.5 mm. long; ovary 8–11-loculate ..... 1. *C. guatemalensis*

00749

1. **Chiclea guatemalensis** Lundell, sp. nov. — Arbor ad 40 m. alta, 90 cm. diam.; folia parce adpresse pubescentia, petiolata, petiolo 2–3 cm. longo; lamina subcoriacea, lanceolata vel oblonga, ad 12 cm. longa, 5.5 cm. lata, apice subacuminata, acutiuscula vel obtusiuscula, basi rotundata et abrupte acuta; flores solitarii, geminati vel apice fasciculati; pedicelli crassiusculi, 1–1.5 cm. longi; sepala 6, raro 4 vel 8, biseriata, coriacea, exteriora late ovata, ad 10 mm. longa, 8 mm. lata, interiora elliptica, ad 8 mm. longa, 6 mm. lata; corolla gamopetala, campanulata, 8.5–12 mm. longa; corollae tubus 3–4.5 mm. longus; petala 6, 3-lobata, connata ⅓, lobis lateralibus oblique ovatis, 6–8 mm. longis, 3–3.5 mm. latis, imbricatis, lobo medio spatulato vel raro anguste elliptico, ad 4.3 mm. longo; stamina 6, 2.5–3.5 mm. longa; filamenta subulata, 1.2–1.5 mm. longa; antherae 2–3 mm. longae, apiculatae; staminodia 6, carnosa, inflexa, parva, 2.5–3 mm. lata, 1.5–2 mm. longa, apice subtruncata, eroso-dentata, extus pubescentia; ovarium hirsutum, 8–11-loculare; semina oblique ellipsoidea, 1.5–2 cm. longa, subcompressa, apice rotundata, basi obtusa vel obtusiuscula, area derasa linearia, 7–11 mm. longa.

Tree, up to 40 m. tall, 36 in. diam., branchlets rather slender, pubescent apically at fiirst with reddish-brown appressed hairs, blackish and covered with a shiny exudate; leaves crowded at apex of branchlets, petiolate, the petioles slender, canaliculate, mostly 2–3 cm. long, drying blackish, pubescent with scattered appressed reddish hairs; leaf blades subcoriaceous, lanceolate or oblong, 6.5–12 cm. long, 2.5–5.5 cm. wide, apex

subacuminate, acutish or obtusish, base rounded and abruptly acute, midvein slender and elevated beneath, sparsely pubescent with appressed reddish hairs, sharply impressed above with narrow central ridge toward base, the blade otherwise glabrous at maturity, the lateral veins numerous, very slender, nearly parallel, rather obscure on both surfaces, faintly reticulate; flowers crowded, solitary or geminate in the leaf axils, sometimes fasciculate at apex of stem and bracteate at base of pedicels; pedicels rather stout, scarcely half the length of petioles, mostly recurved, 1–1.5 cm. long, densely pubescent with brownish appressed hairs; sepals 6, rarely 4 or 8, biseriate, imbricate, coriaceous, tomentulose, the outer broadly ovate, up to 10 mm. long, 8 mm. wide at base, acutish, the inner series elliptic, thinner, up to 8 mm. long, 6 mm. wide; corolla gamopetalous, campanulate, 8.5–12 mm. long, the corolla tube 3–4.5 mm. long, pubescent below the sinuses of the petals externally; petals 6, 3-lobed, the lobes united about one-third of length in middle, the lateral lobes obliquely ovate, 6–8 mm. long, 3–3.5 mm. wide, strongly imbricate and unequal, apex subentire, all of same texture, glabrous; the middle inner lobe of petals spatulate or rarely narrowly elliptic, about 1 mm. wide, entire and rounded at apex, subequalling the lateral lobes; stamens 6, 2.5–3.5 mm. long, inserted at top of corolla tube opposite the petals; filaments curved inward, subulate, 1.2–1.5 mm. long; anthers lanceolate or ovate-lanceolate, 2–3 mm. long, apex attenuate, apiculate, longitudinally dehiscent, appressed pubescent dorsally; staminodia 6, fleshy, strongly inflexed (like thumbless folded hand), 1.5–2 mm. long, 2.5–3 mm. wide, the apex subtruncate, erose-dentate, pubescent externally; disk at base of ovary lobulate, pubescent, the ovary pubescent, 8–11-loculate, tapering into stout style; style glabrous, equalling corolla; stigma punctiform, obscurely and minutely lobulate; fruits ovoid, borne on thick pedicels up to 1.5 cm. long; seed dark brown, shiny, obliquely ellipsoid, 1.5–2 cm. long, 5–5.5 mm. thick in cross-section, subcompressed, rounded at apex with sharp compressed edge, obtuse-rounded or obtusish at base; seed-scar basi-lateral, linear, 7–11 mm. long, up to 1.5 mm. wide, the border of seed-scar smooth, uniform; seed coat hard, 3.5–5 mm. thick; nucellus with thin reddish fibrous cover; endosperm copious.

Guatemala: Dept. Izabal, Cadenas (Puerto Mendez), on Caserio Semox, km. 193 of the Peten-Guatemala Road, in high forest, *zapotal*, April 5, 1975, *C. L. Lundell & Elias Contreras 19140* (LL, type), tree up to 80 ft. high, 20 in. diam., *"chiquibul," "chicle de segunda"*; also, from Dept. Izabal, *Lundell & Contreras 19112* (LL), *19141* (LL), *19142* (LL). Dept. Peten, *Contreras 3103* (LL), *Lundell & Contreras 19107* (LL).

British Honduras: El Cayo District, Chiquibul Forest Reserve, 2.2 miles southeast of Holec Camp, in high forest, alt. 1600–1700 ft., April 25, 1969, *George R. Proctor 30107* (LL), tree, 40 m. tall, flowers cream, *"chiquibul," "sapodilla."*

In my recent treatment of *Manilkariopsis staminodella* (Gilly) Lundell (Wrightia 5: 170. 1975), the locality data are given for most of the above cited collections.

In my earlier studies, I had doubts that *W. A. Schipp 1310*, the type of *M. staminodella*, was conspecific with the other collections cited, be-

cause of the narrowly lanceolate lateral lobes of the petals, narrower or smaller sepals, and thinner leaves widest at or above middle. No other collection available matches *Schipp 1310*. The discovery of a third species, *C. excelsa*, contributed to the conclusion that a distinct genus is represented with a small complex of closely related taxa.

2. **Chiclea excelsa** Lundell, sp. nov — Arbor excelsa; folia novella adpresse pubescentia, petiolata, petiolo 2–2.5 cm. longo, raro ad 3.5 cm. longo; lamina subcoriacea, anguste oblonga vel oblongo-elliptica, ad 15 cm. longa, 4.7 cm. lata, apice breviter acuminata, basi acuta; flores solitarii vel geminati; pedicellis petiolus subaequans; sepala 6, biseriata, ovata vel ovato-elliptica, ad 7 mm. longa et lata; corolla alba, subcoriacea, urceolata, ca. 8.5 mm. longa, gamopetala; corollae tubus 2–3 mm. longus; petala 6, 3-lobata, connata ⅓, lobis lateralibus late ovatis, ad 6 mm. longis, 4 mm. latis, imbricatis, lobo medio lobis lateralibus breviore spatulato; stamina 6, ca. 3 mm. longa; antherae ca. 2.5 mm. longae, apice acutae, barbatae; staminodia 6, carnosa, inflexa, ad 2.5 mm. lata, 1.5 mm. longa, apice subtruncata, eroso-dentata, extus pubescentia; ovarium 7-loculare; fructus ignotus.

Tree about 16 m. high, 25 cm. diam., the branchlets slender to stout, pubescent apically with brownish appressed hairs, glabrate early, the leaf scars conspicuous; leaves crowded at apex of branchlets, appressed pubescent at first, glabrate, the petioles rather slender, elongate, mostly 2–2.5 cm. long, sometimes up to 3.5 cm. long, canaliculate; leaf blades subcoriaceous, narrowly oblong or oblong-elliptic, 8.5–15 cm. long, 3–4.7 cm. wide, apex acuminate, base acute and decurrent on petiole, the midvein elevated beneath, impressed above and with narrow elevated ridge in groove, both surfaces opaque, the venation obscure and inconspicuously reticulate, the primary lateral veins up to 20 pairs, very slender and obscure, anastomosing; flowers solitary or geminate in the leaf axils, the pedicels erect, subequalling or longer than petioles, rather straight, prominently lenticellate, brownish tomentose at first with appressed hairs; calyx brown tomentose, sepals 6, in two series, the outer thick, ovate, 6–7 mm. long, equally as wide at base, obtuse, the inner thinner, less pubescent, ovate-elliptic, equalling the outer, glabrous on inner surface; corolla urceolate, about 9 mm. long, leathery below, pubescent on outer surface in and below the sinuses of petals; corolla white, the tube 2–3 mm. long, rather thick; petals 6, 3-lobed united one-third of length in middle, the lateral lobes ovate, inaequilateral, up to 6 mm. long along outer edge, 4 mm. long along inner edge, up to 4 mm. wide, strongly imbricate, unequal, acute at apex; the middle inner lobe of petals spatulate, about 3 mm. long, shorter than lateral lobes; stamens 6, about 3 mm. long, inserted at top of corolla tube opposite petals, the filaments subulate, curved; anthers lanceolate, about 2.5 mm. long, longitudinally dehiscent, the apex acutish and barbate, with a few hairs on dorsal surface; staminodia 6, fleshy, strongly inflexed (like folded hand), 2–2.5 mm. wide, about 1.5 mm. long, the apex subtruncate, conspicuously erose-dentate, pubescent externally; ovary pubescent, the flat disk at base expanded, lobulate, ovoid, tapering into thick style, the style glab-

rous, 5–6 mm. long, tapering into the minute obscurely lobed stigma; ovary 7-loculate, with 1 ovule in each locule.

Guatemala: Dept. Peten, La Cumbre, in *zapotal*, about 4 km. east on Rio Purula Road, on top of hill, Sept. 19, 1975, *C. L. Lundell & Elias Contreras 19887* (LL, type), tree, 50 ft. high, 10 in. diam., flowers white, "*chiquibul.*"

The large quite narrow leaves short acuminate at apex, straight pedicels mostly 2.5–3.5 cm. long and equalling or longer than the petioles, serve to distinguish *C. excelsa*. *C. guatemalensis* has pedicels half as long and much shorter than petioles, broader leaves mostly elliptic, and rounded or obtuse at apex. Significant differences between the two taxa are given in the key.

3. **Chiclea staminodella** (Gilly) Lundell, comb. nov. *Manilkara staminodella* Gilly, Trop. Woods 73: 11. 1943. *Achras staminodella* (Gilly) Lundell, Phytologia 16: 446. 1968. *Manilkariopsis staminodella* (Gilly) Lundell, Wrightia 5: 170. 1975.

Tree, 30 m. tall, about 1 m. in diam.; branchlets mostly stout, finely reddish tomentose at apex; leaves crowded at apex of branchlets, small, slender petiolate, the petioles up to 2.5 cm. long, canaliculate, with traces of appressed reddish pubescence; leaf blades thin, subchartaceous, glabrous at maturity, lanceolate-elliptic, narrowly elliptic or oblanceolate-obovate, 5–8 cm. long, 2.2–3.5 cm. wide, apex obtuse, rounded or subacutish, often emarginate, base broadly subcuneate or acutish, the midvein elevated beneath, raised above in groove as a narrow ridge, the lateral nerves very slender and rather obscure, the venation obscurely and finely reticulate on both surfaces; flowers borne in axils of leaves, the reddish pubescent pedicels 1–1.5 cm. long; sepals 6, reddish pubescent with fine appressed hairs, the 3 outer subimbricate, coriaceous, lanceolate, up to 9 mm. long, 5 mm. wide, acutish, the 3 inner sepals smaller, oblong, oblanceolate, up to 9 mm. long, 3.5–4 mm wide, subtruncate and apiculate; corolla campanulate, about 8.5 mm. long, the tube 2.5–3 mm. long, cylindric, pubescent below the sinuses of petals; petals 6, 3-lobed, united ⅓ in middle, the lateral lobes obliquely lanceolate, about 5 mm. long, up to 2 mm. wide, sometimes unequal, apex rounded and erose, not strongly imbricate, the middle interior lobe narrowly spatulate, equalling or longer than lateral lobes, about 4 mm. long; stamens 6, 3 mm. long, the filaments subulate, the anthers ovate, pubescent on dorsal surface; staminodia 6, small, fleshy, inflexed, 1–2 mm. long, subtruncate, pubescent on exterior surface; ovary pubescent, 8–9-loculate.

British Honduras: Toledo District (?), Camp 33, B. H. – Guatemala boundary survey, 2850 ft. alt., April 29, 1934, *W. A. Schipp 1310* (F, LL, MICH, isotypes), tree 100 ft., 3 ft. diam, flowers creamy-white, fruits brown and vary in size from mere marbles to that of average sized hen eggs; common tree inland.

The species appears to be known only from the type collection, *Schipp 1310*. The narrow sepals with the inner widest above middle, the narrow lanceolate lateral petal lobes usually less than 2 mm. wide and rounded at apex, and the small anthers, together with the small thin leaves widest at the middle or above, well distinguish the taxon.

NEW GUATEMALAN MELASTOMATACEAE

J. J. Wurdack[1]

Miconia Contrerasii Wurdack, sp. nov. — Sect. *Octomeris*. In systemate Cogniauxii *M. pauperculae* (Naud.) Cogn. affinis, ramulorum hypanthiorumque pilis omnino eglandulosis floribus maioribus differt.

Ramuli teretes sicut petioli foliorum venae primariae subtus inflorescentia hypanthiaque dense puberuli pilis stipitato-stellatis [radiis ca. 0.3–0.4 mm. longis; stipite (0.2–)0.4–0.6(–1) mm. longo]. Petioli 2–6 cm. longi; lamina (7–)11–18 × (3.5–)6–11 cm. ovata apice breviuscule (usque ad 1 cm.) acuminato basi obtusa vel rotundato-truncata, firme membranacea et integra, supra primum sparse stellato-puberula pilis laevibus glanduliferis ca. 0.5 mm. longis sparsissime intermixtis demum glabrata, subtus in superficie sparsiuscule puberula pilis stellatis breviter (ca. 0.2–0.4 mm.) stipitatis, breviter (0.5–1 cm.) 5-plinervata nervis secundariis 0.4–0.8 cm. inter se distantibus nervulis subtus planis obscuris. Panicula 3–5 cm. longa pauciflora floribus 6–14; flores (5-)6-meri polyandri, pedicellis 2–3(–5) mm. longis crassis, bracteolis 4–5 × 1–1.5 mm. anguste oblongis caducis. Hypanthium (ad torum) 3.5 mm. longum; calycis tubus 4 mm. longus, lobis interioribus 1–1.5 mm. longis ovatis vel semicircularibus, dentibus exterioribus stellato-puberulis crassis 3–4 mm. eminentibus; torus intus glaber. Petala glabra 15–16 × 9.5–10 mm. obovata apice rotundato-truncato. Stamina (33–)45–51, isomorphica, glabra; filamenta 7.6–8 mm. longa; antherarum thecae 3–3.2 × 0.6 mm. lanceatae, poro 0.3 mm. diam. paulo ventraliter inclinato; connectivum nec prolongatum nec appendiculatum. Stigma non expansum; stylus 14 × 1.2–0.6 mm. basim versus modice puberulus pilis 0.2–0.4 mm. longis glanduliferis; ovarium (5-)6-loculare omnino inferum apice glabro.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, east of km. 154, June 9, 1975, *C. L. Lundell & Elias Contreras 19406* (US, holotype; LL, isotype), shrub 15 ft. high, 3 in. diam., flowers white; 6 km. east of Chilasco on Concepción Road, in high forest, July 27, 1971, *Elias Contreras 10898* (LL, US, paratypes), tree 20 ft. high, 4 in. diam., fruit greenish.

In stamen form, perhaps the closest relatives of *M. Contrerasii* are two diplostemonous West Indian melastomes still placed in *Heterotrichum*, *H. umbellatum* (Mill.) Urban and *H. cymosum* (Wendl.) Urban; both species have glandular-setose branchlets and hypanthia along with an underlying stellate indument; at least some collections currently identified in both species show basally stellulate-puberulous styles without glandular hairs. The affinity of *M. Contrerasii* with other pleiostemonous taxa of Sect. *Octomeris* (*M. Benthamiana* Triana, *M. idiogena* Wurdack, *M. santaremensis* Wurdack) seems more remote, as does the relationship with *M. Lundelliana* L. Wms. and *M. saxicola* Brandegee. Among Central American melastomes apart from the genus *Conostegia*, *Clidemia*

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Matudae L. Wms. has pleiostemonous flowers but part of the vegetative and inflorescence hairs gland-tipped as well as much smaller flowers with expanded stigmas.

Clidemia Lundellii Wurdack, sp. nov. — Sect. *Staphidium*. *C. petiolari* (S. & C.) Naud. affinis, ramulorum pilis densissimis longioribus floribus maioribus differt.

Ramuli primum sicut petioli inflorescentia hypanthiaque densissime pilis laevibus tenuissimis laxissimis pro parte minore glanduliferis (glandulis minutis caducis) (2.5–)3 mm. longis tarde glabrati. Petioli 1.5–3 cm. longi; lamina 6–11 × 3–5.5 cm. elliptico-ovata apice breviter gradatimque acuminato basi late acuta vel obtusa, subcoriacea et integra vel obscure crenulata, supra sparsiuscule laxeque strigosa pilis 1–1.5 mm. longis ad basim crassiusculis, subtus in nervis primariis secundariisque modice et in nervulis superficieque sparse setulosa pilis gracilibus laxis ca. 1 mm. longis, breviter (ca. 0.5 cm.) 5–7-plinervata nervis secundariis plerumque ca. 3–4 mm. inter se distantibus nervulis subtus obscuris laxe (1.5–2 mm.) reticulatis. Inflorescentiae ut videtur terminales 2.5–5 cm. longae submultiflorae; flores 5-meri, pedicellis 2–5 mm. longis, bracteolis 2–2.5 × 0.9 mm. anguste oblongis subpersistentibus setulosis. Hypanthium (ad torum) 3.5 mm. longum; calycis tubus 0.8 mm. longus, lobis interioribus 0.2–0.4 mm. longis integris eciliatis, dentibus exterioribus setulosis 1.4–1.7 mm. eminentibus; torus intus glaber. Petala glabra 6–6.2 × 3.5–4 mm. oblongo-obovata apice rotundato. Stamina in forma isomorphica glabra; filamenta 4.3–5 mm. longa; antherarum thecae 3.2–3.7 mm. longae lanceatae poro 0.2 mm. diam. paulo ventraliter inclinato; connectivum paulo (0.1–0.2 mm.) prolongatum exappendiculatum. Stigma non expansum; stylus 9.7 × 0.4–0.15 mm. basim versus sparse inconspicueque glandulosus (0.1–0.15 mm.) in ovarii collum ca. 0.5 mm. immersus; ovarium 5-loculare et ⅔ inferum apice glabro.

Guatemala: Dept. Baja Verapaz, Union Barrios, hilltop in high forest west of km. 159, August 13, 1975, *C. L. Lundell & Elias Contreras 19626* (US, holotype; LL, isotype), shrub 3 ft. high, flowers white; Union Barrios, high forest on hilltop 3 km. west of Salama-Coban road, February 8, 1975, *Lundell & Contreras 18958* (LL, paratype), shrub 7 ft. high, fruit green.

Clidemia petiolaris, even in the broad interpretation of Louis Williams, has shorter (to ca. 2 mm.) cauline hairs, thinner and basally nerved leaf blades with finer hairs on the upper surface, and much smaller flowers (petals 4–4.5 mm. long; anther thecae 2–2.5 mm. long). Perhaps another relative is *C. fulva* Gleason, with sparser and stiffer cauline hairs 6–10 mm. long, basally nerved leaf blades, erose-ciliolate interior calyx lobes, longer (6–7 mm.) external calyx teeth, and a sparsely glandular ovary cone. *Clidemia Lundellii* does not seem to be very closely related to *C. dentata* D. Don, despite the leaf plinervation, and the affinities with *C. costaricensis* Gleason and *C. Donnellsmithii* Cogn. are also more remote than with the first two suggested species.

NEW TAXA OF SOLANUM, SECTION ANDROCERAS FROM MEXICO AND ADJACENT UNITED STATES

Michael D. Whalen[1]

It is a common pattern within species-groups of *Solanum* that a few members are widespread, well collected and sufficiently variable to have been named and renamed many times, while an equal or larger proportion are distinctive, local endemics and are poorly known or undescribed. Taxonomic study of the predominantly Mexican section *Androceras* (Nutt.) Marzell, the results of which will be published in detail later, has revealed such a situation. *Solanum rostratum* Dun., which shares with the other species of the section its spiny, accrescent fruiting calyx, tightly investing the berry, and its unique enantiostylous floral mechanism is a wide-ranging weed and has received no fewer than twelve names. The following members of the section, in contrast, are mostly endemics that have gone unrecognized and are newly described here.

The twelve species of the section *Androceras* fall naturally into three groups, marked by corolla color and shape, by vestiture type, by flavonoid chemistry and by distinct geographical centers of diversity. The three groups are named here as series.

I would like to thank Dr. Marshall C. Johnston for composing the Latin diagnoses and Sigma Xi and the National Science Foundation for grants to the author which helped to make this study possible.

Solanum, section **Androceras,** series **Androceras.**

Caules pilis eglandularibus stellatis vel raro pilis stellatis nullis sed caules glaucescentes; corolla 5-angulata, inter angulos ampla plicata flava aut si raro caerulea nunc caules stellato-pubescentes.

Cauline vestiture of eglandular, stellate hairs, or these rarely absent and the stems glaucescent; corollas pentagonal, with ample, plicate interpetalar tissue, yellow or rarely blue, if blue then the stem stellate-pubescent.

Type species: *Androcera lobata* Nutt. (= *S. rostratum* Dun.)

The greatest concentration of taxa in this series of five species occurs in the highlands of central Mexico in the states of Mexico, Hidalgo and Puebla, although certain members of the group are distributed widely, reaching Honduras and Canada.

Solanum Johnstonii M. D. Whalen, sp. nov. — Herbae perennes erectae vel effusae griseo-virides aculeatae 4–8 dm. altae peculiare velutino-farinaceae trichomatibus brevistipitatis stellatis 12–20-radiatis; aculei caulium recti straminei 3–5 mm. longi fere nulli vel remotissimi; folia late ovata leviter vel profunde 1-pinnatifida lobis 3–5 irregularibus latis rotundatis, laminis 5–9 cm. longis utrinque stellato-pubescentibus; racemi extraaxillares 10–20 cm. longi; flores flavi enantiostylosi 2.8–3.5 cm. diametro, corolla zygomorpha lobis inferis lobos superos longioribus; antherae inequales superae 4 rectae 8–12 mm. longae, anthera infera declinata apice incurvata 14–18 mm. longa; calycis tubus accrescens aculeatus demum arcte omnino baccam investiens; semina complanata lenticularia minute foveolata sed cetera laevia 2.5-3 mm. longa 0.5–0.8 mm. crassa.

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Fig. 33. The holotype of *Solanum Johnstonii* M. D. Whalen, *C. G. Pringle 13653* (US).

Erect to spreading, grayish-green, prickly, perennial herb, 4–8 dm. tall, emerging annually from a stout, woody base; vestiture of closely spaced, short-stipitate, 12–20-rayed, stellate hairs, 0.4–0.7 mm. long, giving the herbage a distinctive, velvety-farinaceous appearance; stems terete, branching, 3–8 mm. in diam., almost unarmed or with scattered, straight, yellow spines, 3–5 mm. long, separated at least by their length; leaves broadly ovate, weakly to deeply once-pinnatifid, with 3–5 irregular, broad and rounded lobes or sometimes with the margins merely undulate; the blades 5–9 cm. long, stellate-pubescent on both surfaces, often with a few yellow spines along the midvein above and below; petioles ½–⅔ the length of the blades; racemes extraaxillary, often elongate, 10–20 cm. long, 6–10 flowered; the rachis spiny or not; pedicels 10–20 mm. long; calyx ½–⅔ divided into linear-lanceolate lobes; the tubular portion campanulate, 2.5–3.5 mm. long at anthesis, externally stellate-woolly, and with varying densities of fine, yellow spines; corolla bright yellow, pentagonal-stellate, zygomorphic, with the 2 lower lobes larger than the upper 3 and outcurved; anthers unequal, yellow, long and tapering; the upper 4 straight, 8–12 mm. long; the fifth and lowermost longer, 14–18 mm., declinate, incurved, projecting to one side; style filiform, elongate, declinate, incurved, equalling the long anther but projecting to the opposite side; stigma minute, occupying the unexpanded terminus of the style; berry 9–12 mm. in diam., fully and tightly invested by the accrescent tube of the calyx, which now bears numerous, yellow spines 3–7 mm. long; seeds 30–50 per berry, chocolate brown, flattened-lenticular, 2.5–3.5 mm. long, 0.5–0.8 mm. thick; surface minutely foveolate but otherwise smooth.

Type: Mexico, Durango, mesa near Jimulco, Oct. 10, 1905, *C. G. Pringle 13653* (ARIZ, F, GH, MEXU; US, holotype).

Durango: Between Torreon and Cuencame, dry, level area, Sept. 3, 1966, *C. W. Bollwinkle & R. P. Wunderlin 141* (MO); southeast of Dinamita, bajada of Sierra Sarnosa, Oct. 5, 1972, *H. S. Gentry & R. G. Engard 23091* (MEXU); 14 miles west-southwest of Torreon, limestone canyon below Sapioris microwave station, Aug. 14, 1973, *J. Henrickson 12375* (LL, TEX); same locality, March 25, 1973, *M. C. Johnston, T. L. Wendt, & F. Chiang 10416a* (LL, TEX); 7 miles southwest of Chocolate, steep slopes, Aug. 23, 1939, *F. Shreve 9108* (ARIZ, GH); Sapioris microwave station, 1974-75, *M. D. Whalen 37, 167, 169* (LL, TEX); 4 miles north of Cuencame, stony calcareous soil of flat valley floor, July 25, 1975, *M. D. Whalen 170* (LL, TEX).

S. Johnstonii is a heliophytic inhabitant of dry, gravelly, calcareous soils and is known only from the state of Durango, where it occurs on mesas and in canyons in a small area southwest of Torreon. Its closest relative is certainly *S. rostratum* Dun., which it closely resembles, but from which it differs in its woody-based, perennial habit, its many-rayed, stellate hairs (few-rayed in *S. rostratum*), its frequent paucity of spines, its generally more shallowly lobed leaves, its slightly larger flowers and its larger, flatter and smoother seeds. Experimental hybridizations, which will be described in a later paper, have confirmed that *S. Johnstonii* is reproductively isolated from *S. rostratum*. Development of the hybrid seeds is arrested at an early stage. The name honors Dr. Marshall C.

Johnston, noted Chihuahuan Desert explorer, devoted student of its flora and discoverer of one of the five known populations of this species.

Solanum, section **Androceras,** series **Pacificum** M. D. Whalen, ser. nov.

Caules viscido-pubescentes, pilis uniseriatis capitato-glandularibus raro trichomatibus stelliformibus paucis praesentibus; corolla alba vel interdum lactea stellata lobis saepe aliquantum longioribus quam latioribus.

Stems viscid-pubescent, with uniseriate, capitate-glandular hairs, rarely with a few sessile stellae intermixed; corollas white or occasionally creamy-yellow, stellate, with the lobes often much longer than broad.

Type species: *S. Grayi* Rose. 29600258

The three species of this series are distributed predominantly along the Pacific slope of the Sierra Madre Occidental from Sonora to Guerrero. The following new taxa belong to it.

Solanum leucandrum M. D. Whalen, sp. nov. — Herbae annuae erectae ramosae 3–5 dm. altae radicatae, caules teretes virides leviter viscidi, pilis brevibus glandularibus trichomatibus stelliformibus sessilibus paucis, aculeis rectis 6–9 mm. longis confertissimis; foliorum petioli nervique grosse aculeati, laminae late ovatae lobis 3–5 pinnatis amplis apice deltoideis grosse irregulariter dentatis; racemi 2–4 cm. longi 5–8-flori; flores albi enantiostylosi 7–10 mm. diametro; corolla stelliformis zygomorpha lobis ovato-lanceolatis extus pilosa; antherae heteromorphae sed plus minusve aequales superae 4 flavae graciles rectae, anthera infera collateralis alba ca. 3.5 mm. longa basi valde incrassata distincte sigmoidea apice abrupte sursum arcuata; stigma capitatum 0.3–0.5 mm. diametro; bacca ignota.

Tap-rooted, erect, branched, prickly, annual herbs, 3–5 dm. tall; each cm. of the terete, green stem with ca. 50 spreading, acicular, purplish spines, 6–9 mm. long; cauline vestiture consisting of uniseriate, simple and glandular hairs, ca. 0.2 mm. long, separated by their length, with a few sessile stellae intermixed, these having elongated midpoints; leaves coarsely spiny along petioles and major veins, broadly ovate, pinnately 3–5-lobed; the ample lobes obtuse to acute terminally, coarsely and irregularly dentate; blades 6–10 cm. long, both surfaces with scattered, 3–5-rayed, sessile, stellate hairs, these smaller and more sparse above than below; a few short-stipitate glands also present on the lower sides; petioles ⅓–½ the length of the blades; racemes extraaxillary, 2–4 cm. long, 6–8-flowered; the uniseriate hairs of the rachis more densely spaced and longer than those of the stem; buds obovoid; calyx campanulate, ⅓–½ divided into linear-lanceolate lobes; the tube ca. 1 mm. long at anthesis, externally velutinous, with numerous, spreading, uniseriate hairs, 0.7–1.0 mm. long; corolla 7–10 mm. in diam., stellate, ivory-colored, lacking a central, black, stelliform marking, externally stellate-pubescent, slightly zygomorphic; the lower lobes larger than the upper ones; filaments short; anthers heteromorphic; the lowermost one white, strongly swollen basally, sharply sigmoid, with the terminal end abruptly upturned, ca. 3.5 mm. long; the other 4 yellow, slender, straight, flanking the lower one and about the same length; style slender, terminally incurved, about the length of the anthers; stigma capitate, 0.3–0.5 mm. in diam., fruit unknown.

Fig. 34. The holotype of *Solanum leucandrum* M. D. Whalen, *M. D. Whalen 23* (TEX).

Type: Mexico, Puebla, 48 km. east of Cuautla on road to Izúcar de Matamoros, July 31, 1974, *M. D. Whalen 23* (LL, TEX).

S. leucandrum is known only from the type locality. Nevertheless it is deemed sufficiently distinct from its nearest relative, *S. Grayi*, to warrant specific status. It differs from that species in the presence of stellate hairs on the stems, in its less dissected leaves with stellate hairs above, in its smaller flowers, in its corolla lacking the central black star characteristic of *S. Grayi* and in its unique, white, lower anther. *S. leucandrum* occurs nearly 100 km. east of the nearest known populations of *S. Grayi*, in a habitat noticeably drier than that characteristic of the latter species.

Solanum Grayi Rose var. **grandiflorum** M. D. Whalen, var. nov.—Folia 1–3-pinnatifida supra glandularia; racemi 10–20-flori interdum ramosi paniculati; alabastra distincte bilateraliter symmetricalia; corolla 15–22 mm. diametro, lobis lanceolatis vel oblanceolatis minimum duplo longioribus quam latioribus; anthera infera 8–12 mm. longa; stylus filiformis apice stigmaticus sed non expansus; semina 2.5–3.0 mm. longa.

Leaves 1–3-pinnatifid, glandular above; racemes 10–20-flowered, occasionally branched and paniculate; buds distinctly bilaterally symmetrical; corolla 15–22 mm. in diam.; the lanceolate to oblanceolate lobes more than twice as long as broad; the enlarged lower anther 8–12 mm. long; stigma occupying the unexpanded tip of the filiform style; seeds 2.5–3.0 mm. long.

Type: Mexico, Guerrero, Vista Station, 4000 ft. alt., Sept. 28, 1900, *C. G. Pringle 9226* (F, MEXU, MO, NY; US, holotype).

Colima: southwest outskirts of Cd. Colima, rocky roadside, May 19, 1973, *B. & J. Hansen & M. Nee 1457* (WIS); Cd. Colima, Oct. 24, 1910, *C. R. Orcutt 4509* (F).

Guerrero: Taxco Viejo, Sept. 18, 1932, *R. Q. Abbott 418* (ENCB); Mina, Placeres, Sept. 4, 1936, *G. B. Hinton 9358* (LL, NY, TEX); Galeana, Atoyac, barranca, Sept. 8, 1939, *G. B. Hinton 14600* (ARIZ, ENCB, F, GH, LL, MO, NY, TEX, US); 17 km. west of Teloloàpan, rocky, south facing hillsides, Nov. 21, 1971, *H. H. Iltis & T. S. Cochrane 23* (WIS); Rio Balsas, Aug. 26, 1910, *C. R. Orcutt 4187* (F); Iguala, Aug. 1905, *J. N. Rose, et. al. 9268* (NY, US).

Jalisco: west of Guadalajara, Sierra de la Venta, July 28, 1968, *L. M. Villareal de Puga 1503* (ENCB).

Mexico: Temascaltepec, Ixtapan, barranca, July 16, 1932, *G. B. Hinton 1070* (F, MO, US); 56 km. south of Temascaltepec on road to Luvianos, moist thicket, Sept. 3, 1965, *K. Roe, et. al. 1649* (WIS, ENCB); 8 km. southwest of Luvianos on road to Nanchititla, Sept. 2, 1965, *J. Rzedowski 20738* (ENCB, US, WIS).

Michoacan: Tacupa, Feb. 15, 1934, *G. B. Hinton 5634* (NY, US); Apatzingan, La Majada, Aug. 9, 1941, *W. C. Leavenworth & H. Hoogstraal 1415* (F, MO, NY).

Morelos: 2 km. southeast of Coatlàn del Rio, Aug. 27, 1967, *J. F. Crespo 84* (ENCB).

Nayarit: Acaponeta, moist ravine, April 9, 1910, *J. N. Rose, et. al. 14230* (NY, US).

Sinaloa: Villa Union, Jan. 1895, *F. H. Lamb 401* (MO, NY, US); Mazatlan, 1925, *J. G. Ortega 5639* (ENCB, US); Rosario, July 22, 1897, *J. N. Rose 1817* (US); Villa Union, open field, April 2, 1910, *J. N. Rose, et. al. 13925* (NY, US); El Limon, abandoned fields, July 30, 1975, *M. D. Whalen 190* (LL, TEX).

S. Grayi Rose, "*huevo de gato*", is a wide-ranging species, extending from Guerrero north to southern Sonora. In the latter state and in northern Sinaloa, it is sympatric with another member of the series *Pacificum*, *S. Lumholtzianum* Bartl. In this region, displacement of reproductive characters has resulted in the formation of a small-flowered and otherwise distinctive race of *S. Grayi*, from which unfortunately, Rose took his type material for the species. This locally derived race must then be called var. *Grayi*, and the common, more widely distributed large-flowered form is newly named here as var. *grandiflorum*. In addition to its smaller flowers, var. *Grayi* may be distinguished from var. *grandiflorum* by its less dissected leaves, nearly eglandular above, its fewer-flowered racemes, its obovoid buds, not markedly bilaterally symmetrical, its capitate stigma and its larger seeds.

Solanum, section **Androceras,** series **Violaceiflorum** M. D. Whalen, ser. nov.

Caules viscido-pubescentes pilis uniseriatis capitato-glandularibus; corolla caerulea vel violacea stellata vel stellate 5-angulata lobis lanceolatis vel deltoideis.

Stems viscid-pubescent, with uniseriate, capitate-glandular hairs; corolla blue or violet, stellate to stellate-pentagonal, with the lobes lanceolate to deltoid.

Type species: *S. citrullifolium* A. Br. 29600230

This series of four species, centered in the northern part of the Chihuahuan Desert, achieves its greatest diversity in Trans-Pecos Texas and adjacent Chihuahua and Coahuila. The following new taxa are among its members.

Solanum davisense M. D. Whalen, sp. nov. — Herbae annuae erectae aculeatae 4–8 dm. altae radicatae parte supera ramosa; caules teretes aculeati viscido-villosi, glandulis stipitatis 0.2–0.5 mm. longis, pilis uniseriatis remotis effusis saepe 1 mm. longis vel longioribus; foliorum petioli nervique aculeati, laminae 2–3-pinnatifidae, lobulis ultimis acutis lanceolatis vel anguste deltoideis, racemi 4–7 cm. longi, 5–9-flori; alabastra obovoidea, flores violacei enantiostylosi 1.2–1.8 mm. diametro; corolla stellate 5-angulata debile zygomorpha lobis deltoidea-acuminatis; antherae flavae heteromorphae, superae 4 rectae 4.5–5.5 mm. longae, anthera infera 5–8 mm. longa incurvata; stigma indistincte capitatum; bacca ca. 9 mm. diametro; calycis tubus accrescens aculeatus demum arcte omnino baccam investiens; semina brunnea lenticularia minute foveolata sed cetera laevia 2.6–3.0 mm. longa.

Erect, tap-rooted, prickly, annual herbs, 4–8 dm. tall, branching above; the terete, green stems viscid-villous, with capitate-glandular hairs

Fig. 35. The holotype of *Solanum davisense* M. D. Whalen, *M. D. Whalen 217* (TEX).

0.2–0.4 mm. long and varying quantities of fine, spreading, uniseriate hairs 0.5–2.0 mm. long; cauline spines straight, yellow or often dark-tipped, 2–7 mm. long, 5–20 per cm. of mature stem; leaves spiny along petioles and main veins, 2–3-pinnatifid, usually with a much-dissected appearance; the ultimate lobes acute-tipped, lanceolate to narrowly deltoid; blades 5–10 cm. long, often strigulose above, with straight uniseriate hairs, 0.5–1.0 mm. long, below with sessile, few-rayed stellae, ca. 0.5 mm. long, and scattered sessile or short-stipitate glands; racemes 4–7 cm. long. 5–9-flowered; pedicels slender in flower, 5–9 mm. long; buds to 11 mm. long, obovoid and terminally rounded, not appreciably bilaterally symmetrical; calyx campanulate, ½–⅔ divided into acute, linear lobes; the tubular portion 1.5–2.0 mm. long at anthesis, externally villous, with spreading, simple hairs ca. 1 mm. long, intermixed with acicular, yellow spines 2–5 mm. long; corolla violet, 1.2–1.8 mm. in diam., pentagonal-stellate; the lobes deltoid-acuminate, unequal; anthers yellow; the lowermost one 5–8 mm. long, incurved, apically marked with violet; the others shorter, 4.5–5.5 mm. long, straight; style filiform, incurved, equalling the long anther; stigma weakly capitate, 0.3–0.5 mm. in diam.; berry ca. 9 mm. in diam., tightly and completely invested by the spiny, accrescent tube of the calyx; seeds dark brown, lenticular, 2.6–3.0 mm. long, minutely foveolate but otherwise smooth, not reticulately ridged.

Type: Texas, Jeff Davis Co., Madera Canyon in the Davis Mountains, dry stream bed, Aug. 9, 1975, *M. D. Whalen 217* (LL; TEX, holotype; isotypes to be distributed).

Texas: Brewster Co., Chisos Mountains, between Boot Spring and South Rim, igneous soil, 7000 ft. alt., July 15, 1955, *B. H. Warnock 12717* (SRSC). Jeff Davis Co., Davis Mountains, Madera Canyon, Aug. 20, 1946, *D. S. Correll 13995* (LL, NY, TEX); Davis Mountains, Limpia Creek, 6000 ft. alt., Sept. 15, 1934, *L. C. Hinckley 18* (F, NY, SRSC, TEX); Davis Mountains, McDonald Observatory, Aug. 23, 1944, *C. L. & A. A. Lundell 13148* (LL, TEX); Base of Mt. Locke, July 29, 1941, *H. B. Parks 1717* (MO). Presidio Co., west side of Chinati Mountains, Sept. 10, 1961, *D. S. Correll & M. C. Johnston 24405* (LL, TEX); north Chinati Mountains, igneous soil, 3500 ft. alt., *B. H. Warnock 19263* (SRSC).

Coahuila: Del Carmen Mountains, Sept. 9, 1936, *E. G. Marsh 727* (F, GH, MEXU, TEX).

S. davisense appears to be strictly montane species, ranging from the Davis Mountains of Trans-Pecos Texas to the Sierra del Carmen of northern Coahuila, occurring sporadically on igneous soils and in sand or gravel stream beds. It is sympatric with its closest and more wide-ranging relative, *S. citrullifolium*, from which it differs in its more erect habit, its more deeply dissected, acute-lobed leaves, its obovoid buds, not noticeably bilaterally symmetrical, its smaller flowers and its smooth, unridged seeds.

Solanum citrullifolium A. Br. var. **Knoblochii** M. D. Whalen, var. nov. — Caules juniores viscido-villosi, trichomatibus uniseriatis albis ex parte glandulari-capitatis ex parte 2–3 mm. longis, aculeis rectis 3–5 mm. longis remotis interdum fere nullis; folia irregulariter 2-pinnatifida lobis ultimis ovatis vel lanceolatis acutis; corolla albo-caerulea vel alba stelliformis lobis lanceolatis, pedicelli fructiferi ad angulum 90° patentes; cristae seminis reticulatae.

Young stems viscid-villous; many of the uniseriate, white, partly capitate-glandular trichomes reaching 2–3 mm.; the straight, cauline spines 3–5 mm. long, widely spaced, sometimes almost wanting; leaves irregularly 2-pinnatifid; the ultimate lobes ovate to lanceolate, acute; corolla pale blue to white, stellate, with lanceolate lobes; fruits diverging at right angles from the rachis; seeds reticulately ridged.

Type: Mexico, Chihuahua, Mojarachic, Aug. 16, 1940, *I. Knobloch 8006* (US, holotype).

Chihuahua: San Juancito, July 12, 1938, *I. Knobloch 5430* (F).

Known only from two localities in the high Tarahumara country of western Chihuahua, var. *Knoblochii* occurs far from the range of the typical variety in Texas and Coahuila. It is named for Irving Knobloch, discoverer of both known populations.

Solanum heterodoxum Dun. var. **setigeroides** M. D. Whalen, var. nov.— Herbae annuae diffusae ramosissimae; caules sparse stipitato-glandulares; caules racemique dense uniformiter aculeati aculeis multis tenuibus acicularibus effusis vel leviter retrorsis 5–9 mm. longis; semina 2.4–2.7 mm. longa crassa angularia lateribus planis cristis non reticulatis.

Much-branched, spreading, annual herbs; stems and racemes sparsely stipitate-glandular, densely and uniformly bristly, with numerous fine, acicular, spreading or slightly descending spines, 5–9 mm. long; seeds 2.4–2.7 mm. long, thick, angular, flat-sided, not reticulately ridged.

Type: New Mexico, Grant Co., 12 miles west of Silver City, Aug. 4, 1975, *M. D. Whalen 201* (LL; TEX, holotype; isotypes to be distributed).

Arizona: Cochise Co., 2 miles east of Douglas, Guadalupe Canyon road, Aug. 16, 1962, *R. J. Barr 62-508* (ARIZ). Graham Co., 14.3 miles west of U. S. 70 on Aravaipa road, alluvial soil, Oct. 19, 1968, *D. Pinkava, et. al. 15007b* (ASU). Yavapai Co., Kirkland, Oct. 5, 1930, *R. H. Peebles, et. al 7422* (ARIZ).

New Mexico: Catron Co., north of Jackson, Dry Creek Camp, gravelly washes, Aug. 17, 1942, *O. M. Clark 10514* (UNM). Grant Co., near White Signal, granite gravel, Sept. 20, 1944, *F. A. Barkley 14707* (TEX); City of Rocks southeast of Hurley, Sept. 12, 1942, *O. M. Clark s. n.* (UNM); Hanover, Sept. 1911, *J. M. Holzinger, s. n.* (MO); 14 miles south of San Lorenzo, in sandy floodplain of Mimbres River, Aug. 5, 1975, *M. D. Whalen 205* (LL, TEX). Hidalgo Co., 12 miles east of Animas, silty, slightly saline margin of Las Playas dry lake, Nov. 3, 1975, *M. D. Whalen 239* (LL, TEX). Lincoln Co., northeast of Carrizo, moist sand, Aug. 28, 1965, *F. & M. Iwen 290* (WIS). Sierra Co., Black Range, meadow at Taylor Creek, June 21, 1952. *H. Dittmer 5549* (UNM). Socorro Co., 5 miles east of Rosedale, Aug. 29, 1948, *Dunn 4774* (UNM).

Texas: Culberson Co., 2 miles below Diablo Refuge, Diablo Mountains, July 12, 1958, *B. H. Warnock & M. C. Johnston 16716* (SRSC). El Paso Co., plains east of El Paso, Aug. 8, 1931, *O. M. Clark 4288* (UNM).

Chihuahua: 2.3 miles east of Samalayuca, in sandy flats and small dunes, Sept. 13, 1972, *J. Henrickson 7488* (LL, TEX); Gallegos, Oct. 2, 1958, *Geo. N. Jones 23089* (WIS); Nueva Casas Grandes, Aug. 28, 1957, *I. Knobloch 380* (ENCB); 4.6 miles northeast of Buenaventura, Aug. 28, 1967, *R. L. Oliver, et. al. 529* (MO); Juarez, sand arroyo, 1912, *E. Stearns s. n.* (MO).

S. heterodoxum var. *setigeroides* is a frequent roadside weed of southern New Mexico and northern Chihuahua, forming large colonies in gravelly or sandy, open places. The name signifies the superficial resemblance of this variety to *S. citrullifolium* A. Br. var. *setigerum* Bartl., with which it should not be confused. The flowers here are ca. 1 cm. in diam., much smaller than in *S. citrullifolium*, and typical of *S. heterodoxum*.

Solanum tenuipes Bartl. var. **latisectum** M. D. Whalen, var. nov.—Plantae e caudice lignoso ramosae vel caulis erectus parte supera ramosa; caules saepe viscido-glandulares caules juniores pilis ex parte rectis effusis uniseriatis ca. 0.5 mm. longis; folia irregulariter 1–2-pinnatifida lobis ultimis obtuse vel acute angulatis vel rotundatis longitudine latitudineque plus minusve aequalibus; semina 2.7–3.3 mm. longa.

Plants branched from the woody, perennial base or with an erect stem and branched above, usually viscid-glandular and with straight, spreading, uniseriate hairs ca. 0.5 mm. long scattered along young stems; leaves irregularly 1–2-pinnatifid; the ultimate lobes usually about as broad as long, obtusely or acutely angled or rounded; seeds 2.7–3.3 mm. long.

Type: Mexico, Coahuila, Sierra de las Cruces, eastern foothills, margin of silty valley floor at base of rocky cliffs, Aug. 13, 1940, *I. M. Johnston & C. H. Muller 224* (GH; TEX, holotype).

Texas: Presidio Co., 30 miles east of Presidio on road to Big Bend Ranch, among boulders, April 20, 1961, *D. S. Correll & R. C. Rollins 23681* (LL, TEX).

Chihuahua: 9.1 miles northeast of Cuchillo Parado along Rio Conchos, sandy riverbank area, Sept. 17, 1971, *J. Henrickson 6793* (LL, TEX); Sierra San Carlos, road to San Carlos Mines, Aug. 9, 1940, *I. M. Johnston & C. H. Muller 69* (LL, TEX); Cañon del Rayo, northeastern side of Sierra del Diablo, July 25, 1941, *R. M. Stewart 849* (GH); Cañon del Coyote, road from Guimbalete west to southern end of the Sierra del Diablo, Sept. 15, 1942, *R. M. Stewart 2613* (GH).

Coahuila: 9 km. south of Parras on Sierra Negra, July 3, 1941, *L. R. Stanford, et al. 177* (ARIZ, GH, MO, NY); vicinity of San Rafael, northeast base of Sierra de las Cruces, silty flats, June 10, 1941, *R. M. Stewart 413* (GH, LL, TEX); calcareous eastern foothills of Sierra de las Cruces, vicinity of Santa Elena Mines, May 31, 1941, *R. M. Stewart 1933* (GH).

Durango: Sapioris microwave station, steep limestone slopes, Aug. 13, 1973, *M. C. Johnston, et. al. 12228* (TEX).

Like the typical variety of *S. tenuipes*, this one is at home on calcareous, gravelly soils of the Chihuahuan Desert. It is more westerly in distribution however, ranging from the Big Bend area of Texas south along the border of Chihuahua and Coahuila to eastern Durango and the Sierra Parras of southern Coahuila.

NEW SPECIES OF CUPANIA (SAPINDACEAE) AND STYLOGYNE (MYRSINACEAE) FROM GUATEMALA AND ECUADOR

CYRUS LONGWORTH LUNDELL

Cupania longicaudata Lundell, sp. nov. — Arbor; ramuli minute strigilloso-pubescentes; folia glabrata, 1–6-foliolata; foliola chartacea, lanceolata, 15–32 cm. longa, 5–8.5 cm. lata, apice caudato-acuminata, basi acuta, integra, petiolulus ad 6 mm. longus; inflorescentia paniculata, axillaris vel terminalis, ad 15 cm. longa, minute et dense adpresse pubescentia; pedicelli ca. 2 mm. longi; sepala ovato-lanceolata, ca. 1.5 mm. longa, acuta; petala villosa, ca. 2 mm. longa; filamenta pilosa; ovarium triquetrum; capsula obovata, strigillosa.

Giant tree; branchlets brownish, the indument minute and appressed; leaves large, the leaflets 1–6, mostly 2–4, with short thickened petiolules up to 6 mm. long; leaf blades chartaceous, entire, lanceolate or oblong-lanceolate, 15–32 cm. long, 5–8.5 cm. wide, apex caudate-acuminate, the slender acumen up to 6 cm. long, base acute, costa elevated beneath, raised above and minutely puberulent, the primary lateral veins 8–12-pairs; inflorescence paniculate, axillary, or appearing terminal with leaves reduced to bracts, up to 15 cm. long, with dense minute indument, the longer hairs appressed; pedicels about 2 mm. long, puberulent; sepals ovate-lanceolate, about 1.5 mm. long, acute; petals with bilobate villous scales 2 mm. long; filaments pilose below; ovary triquetrous; immature capsule 3-lobed, obovate, subtruncate at apex, rather sparsely strigillose; style thick and strigillose.

Guatemala: Dept. Peten, Cadenas, in high forest, bordering Rio Sarstun, km. 170/171 of road, March 14, 1967, *Elias Contreras 6747* (LL, type), tree, 100 ft. high, 30 in. diam., flowers white.

Closely related to *C. macrophylla* A. Rich., of authors, the tree differs in its thin large lanceolate leaflets which are conspicuously caudate-acuminate. The leaves of *C. macrophylla* are obovate and coriaceous, never acuminate, much less caudate!

Cupania cubensis Gomez & Molinet, Gomez de la Maza, Fl.Cuba, 35. 1887, appears to be the correct name for *C. macrophylla* A. Rich., of authors, for *Cupania macrophylla* Mart., 1838, predates *C. macrophylla* A. Rich., 1845.

Cupania macrophylla Mart. was transferred to *Talisia* by Radlkofer becoming *Talisia macrophylla* (Mart.) Radlk., Sitzungsber. bayer Akad. 8: 347. 1878.

I have not seen type material of the taxa involved.

Stylogyne Gentryi Lundell, sp. nov. — Arbor parva, glabra; folia petiolata, elliptica vel obovato-elliptica, apice acuta vel subacuminata, basi cuneata, integerrima, membranacea, punctata; inflorescentia abbreviata, congesta, ca. 1 cm. longa, fasciculata, dense multiflora; flores 5-meri, pedicellati; sepala punctata, ca. 2 mm. longa, subintegra; corolla alba, 4–5 mm. longa; stamina 5, filamenta libera.

Small glabrous tree, up to 8 m. tall; branchlets slender, terete; leaves petiolate, the petioles marginate, up to 1 cm. long; leaf blades thin, membranaceous, elliptic or obovate-elliptic, 15–32 cm. long, 5–8.5 cm. wide, apex abruptly acute or short acuminate, base cuneate and decurrent, conspicuously punctate; inflorescence congested, subsessile, fasciculate in leaf axils or at nodes below the leaves, multiflowered, shorter than petioles, glabrous; flowers 5-parted, the pedicels of flowers 2–3 mm. long; sepals oblongish, about 2 mm. long, punctate; corolla white, 5-lobed to below middle, 4–5 mm. long, the lobes punctate with elongated glands; stamens with free filaments attached at base of corolla tube; ovary small with short style, apparently abortive in staminate flowers.

Ecuador: Prov. Los Rios, Hacienda Los Ocho, km. 50 on road from Santo Domingo to Quevado, in wet forest, alt. 200 m., Feb. 4, 1974, *Al Gentry 9639* (LL, type; MO, isotype), treelet 3 m., flowers white, mostly in bud. Also, *Gentry 9908* (LL) and *12026* (LL) from the same general locality.

The relationship of *S. Gentryi* appears to be with *S. ardisioides* (H.B.K.) Mez and *S. micrantha* (H.B.K.) Mez, both poorly known species.

STUDIES OF AMERICAN PLANTS – XII

Cyrus Longworth Lundell

In the Yucatan Peninsula area, the Sapodilla-Nispero complex of the Sapotaceae may have as many as a score of species in at least three genera, which have been tapped commercially for chicle. *Achras* L., *Chiclea* Lundell and *Manilkariopsis* (Gilly) Lundell are the genera recognized. That *Manilkara* Adanson will be found in northeastern Yucatan or Quintana Roo is possible, for this genus is well represented in the West Indies and northward to the Florida Keys.

Achras Zapota L. has been the source of top quality chicle gum since prehistoric times. The quality of the gum from other species is known to vary, being inferior in taxa locally called *chiquibul* and *chicle segunda* by chicleros. The vernacular name, *chico zapote,* is not used exclusively for *Achras Zapota,* which compounds the confusion.

In continuation of my studies of the Sapotaceae, another new species of *Manilkariopsis* is segregated, and three transfers are made to *Calocarpum* Pierre from *Pouteria* Aubl. and *Lucuma* Molina. A new genus, *Peteniodendron,* is described, along with its type species, *P. belizense,* to include an unusual group of dioecious taxa with heteromorphic unisexual flowers, included in *Pouteria* by recent authors.

A new genus, *Neeopsis,* is proposed in the Nyctaginaceae. The single species in the genus, originally described as *Neea flavifolia* Lundell, is a shrub apparently endemic to the Maya Mountains.

Undescribed taxa, transfers, and sundry notes are included for species in eight additional families, the Malpighiaceae, Euphorbiaceae, Staphyleaceae, Guttiferae, Thymelaeaceae, Myrsinaceae, Apocynaceae and Rubiaceae.

All of the genera and species treated are from Mexico and Central America, from Tamaulipas on the north to Panama on the south, but mostly from the Maya Mountains of southern British Honduras and southeastern Peten.

NYCTAGINACEAE

Neeopsis Lundell, gen. nov. – Frutex; ramuli graciles, teres, glabri; folia flavida, opposita, subopposita vel verticillata, glabra, petiolata, petiolo canaliculato; lamina subcoriacea vel chartacea, lanceolata vel anguste elliptica, ad 11 cm. longa, 5 cm. lata, apice acuminata vel obtusa, acumine obtuso vel acuto, basi rotundata vel attenuata et acuta; flores dioici; inflorescentia glabra, capillacea, cymoso-paniculata, pauciflora, ad 10 cm. longa, longe pedunculata, pedicellis ad 1.2 cm. longis; hypanthium staminatum campanulatum, parvum, ca. 3 mm. longum, apice ca. 2.2 mm. latum, 5-dentatum, induplicato-valvatum; stamina 6, biseriata; ovarium glabrum; stigma penicillata; flores pistillati ignoti; anthocarpium glabrum, rubrum, ovoideum, ad 1 cm. longum.

Type species: *Neeopsis flavifolia* (Lundell) Lundell (=*Neea flavifolia* Lundell).

The genus has close affinity to *Neea*. The flowering material is scanty, but the hypanthium in the staminate flowers of *Neeopsis* is altogether different from *Neea* in that it is campanulate with flaring limb fully twice as wide as the tube. In the dried flower, the flaring limb is up to 2.2 mm. wide with the hypanthium only 3 mm. long. The staminate flowers appear to be perfect, but not so functionally. The pistillate flowers are unknown, but the pistillate perianth, persistent in fruit, is closely contracted at apex. The anthocarp is fleshy, red. The seed, embryo, cotyledons and radicle appear to be the same as in *Neea*. All parts of the plant dry yellowish, while in *Neea* specimens usually dry blackish. The capillaceous inflorescence is a striking feature. The stamens are included as in *Neea*.

Neeopsis flavifolia (Lundell) Lundell, comb. nov. *Neea flavifolia* Lundell, Wrightia 4:131. 1970.

Guatemala: Dept. Peten, La Cumbre, on top of hill, west of km. 140 of Cadenas Road, in clearing, Aug. 2, 1969, *Elias Contreras 8823* (LL, type), shrub, 7 ft. high, 1 in. diam., flowers yellowish-green; La Cumbre, east of km. 142 of Cadenas Road, on top of hill on Las Cañas Road, in low forest, July 31, 1969, *Contreras 8815* (LL), shrub, 10 ft. high, 1 in. diam., fruit green; La Cumbre, in *zapotal* west of km. 142 of Cadenas Road, about 1 km. from road, Sept. 12, 1975, *C. L. Lundell & Elias Contreras 19851* (LL), shrub, 20 ft. high, 3 in. diam., fruit red.

MALPIGHIACEAE

Malpighia mayana Lundell, sp. nov. — Frutex; ramuli novelli parce strigosi; folia subsessilia, petiolo ad 3 mm. longo, marginato; lamina membranacea, glabra, lanceolata vel oblongo-elliptica, 7.5–23 cm. longa, 2.7–7 cm. lata, apice acuminata, basi acuta, nervis lateralibus 9–12-jugis; inflorescentia axillaris, corymbosa, ad 5 cm. longa, parce adpresse pubescentia, longe pedunculata; sepala ad 3 mm. longa, apice inflexa; petala lilacina, unguiculata, inaequalia, obovato-elliptica, ad 8 mm. longa; stylus 3; drupa glabra.

Shrub, about 5 m. tall, 7.5 cm. diam., the branchlets slender with elongated internodes, reddish at first and rather sparsely strigose with closely appressed dibrachiate hairs, leaves dark green above, paler beneath, subsessile, the petioles marginate, up to 3 mm. long, strigose at first; leaf blades very thin, membranaceous, glabrous except for a few appressed dibrachiate hairs at first, lanceolate or oblong-elliptic, 7.5–23 cm. long, 2.7–7 cm. wide, apex acuminate, base acute and decurrent on petiole, the midvein elevated beneath, nearly plane above, the primary lateral veins 9–12-pairs, very slender and anastomosing about one-third of distance to margin; inflorescence racemose-corymbose, the corymbs solitary in the axils of apical leaves, up to 5 cm. long, sparsely pubescent with appressed dibrachiate hairs, the peduncles up to 3 cm. long, the flowers crowded at apex, the pedicels slender, up to 1 cm. long, jointed and bracteolate about one-third above base; sepals greenish, oblong-elliptic, up to 3 mm. long, inflexed apically, 1 free, the others glandular, the glands 6, thick, oblong, reflexed apically, shorter than sepals; petals

lilac, unequal, obovate-elliptic, the larger up to 8 mm. long, with long claw, the blade sharply crested dorsally and with thin erose margin; stamens equalling sepals, shorter than styles; styles 3, equal or nearly so, thickly subulate, the stigma foot-like with dark green inner heel; drupes (immature) ovoid, glabrous.

Guatemala: Dept. Peten, La Cumbre, in high forest, *zapotal*, on hill about 4 km. east on Rio Purula Road, Sept. 19, 1975, *C. L. Lundell & Elias Contreras 19882* (LL, type), shrub, 15 ft. high, 3 in. diam., petals lilac.

M. mayana is notable for its large very thin essentially glabrous long acuminate subsessile leaves and dense corymbs borne on peduncles up to 3 cm. long. It does not appear to be closely related to any species reported from the area.

EUPHORBIACEAE

Acalypha gummifera Lundell, Contr. Univ. Mich. Herb. 4: 10. 1940.

Guatemala: Dept. Peten, La Cumbre, on top of rocky hill, March 2, 1967, *Elias Contreras 6640* (LL), plants about 12 ft. high, 1 in. diam., flowers pinkish; Guayacan, on rocky wall in forest bordering Laguna Guayacan, Dec. 30, 1967, *Contreras 7379* (LL), shrub, 7 ft. high, fruit green.

This very distinct species was first collected by W. A. Schipp (type from Camp 34, British Honduras boundary, *Schipp 1290*), which is not far removed from La Cumbre. The collection from the latter site is pilose along the costa beneath as well as barbellate in the axils of primary veins. The smooth capsules are notable in the subgenus *Linostachys* to which the taxon belongs.

Acalypha oblancifolia Lundell, sp. nov. – Frutex, glaber vel fere glaber; ramuli teres; folia glabra, petiolata, petiolo 1–2 cm. longo, raro ca. 3 mm. longo; lamina membranacea, flavida, oblanceolata, 7.5–22 cm. longa, 2–8 cm. lata, apice caudato-acuminata, basi angustata, rotundata, crenato-denticulata, nervis lateralibus 7–10-jugis; stipulae subulatae, 2–5 mm. longae; flores monoici; flores staminati spicati; spicae axillares, ad 5 cm. longae, strigillosae; flores pistillati racemiformi; racemi pistillati axillares, racho filiformi, ad 15 cm. longi, puberuli; pedicelli 0.5–3 mm. longi; sepala pistillata 5, anguste lanceolata, 1 mm. longa, acuminata; ovarium tuberculatum; styli ca. 3 mm. longi, basi 3-lobati; lobis ca. 1 mm. longis; capsula tuberculata, ca. 4 mm. diam.

Shrub; branchlets slender, terete, glabrous except for a few short appressed hairs at apex on new growth; leaves yellowish, glabrous except for a few appressed hairs along costa and veins in young leaves, densely punticulate, petiolate, the petioles usually 1–2 cm. long, sometimes as short as 3 mm. at apex of branchlets; leaf blades very thin, membranaceous, oblanceolate, 7.5–22 cm. long, 2–8 cm. wide, apex caudate-acuminate, the acumen up to 2.5 cm. long, narrowed to the rounded base, the midvein whitish and elevated on both surfaces, 3-nerved at base, but the blade otherwise pinnately veined, the primary lateral veins slender,

arcuately ascending, 7–10-pairs, anastomosing near the margin, the margin crenate-denticulate; stipules subulate, rigid, 2–5 mm. long; flowers monoecious; staminate spikes in axils of apical leaves up to 5 cm. long, pubescent with short straight subappressed hairs; pistillate inflorescence racemiform, axillary, capillaceous, up to 15 cm. long, puberulent with antrorse hairs, the flowers remote; pedicels short, up to 3 mm. long in fruit; sepals of pistillate flowers 5, narrowly lanceolate, 1 mm. long, acuminate, almost glabrous; ovary tuberculate; style 3-lobed about 1 mm. at base, about 3 mm. long, the lobes laciniate; capsules tuberculate, about 4 mm. in diam.

Guatemala: Dept. Izabal, El Estor, in high forest bordering Lake Izabal, March 7, 1972, *Elias Contreras 11192* (LL, type), fruit green.

Altogether different in its thin, almost transparent, yellowish, glabrous, crenate leaves, short rigid stipules, and tuberculate capsules, *A. oblancifolia* has affinity to *A. Schlechtendaliana* Muell. Arg. of the subgenus *Linostachys*.

Acalypha tamaulipasensis Lundell, sp. nov. — Frutex; ramuli parce pubescentes, graciles; folia petiolata, petiolo ad 2.5 cm. longo; lamina membranacea, parce pubescentia, lanceolata, 6.5–12.5 cm. longa, 2–4.3 cm. lata, apice acuminata, basi rotundata, 3-nervia, crenulato-denticulata, nervis lateralibus 6–9-jugis; stipulae setosae, ad 5.5 mm. longae; inflorescentiae axillares; flores pistillati anguste paniculati; paniculae pauciramosae, pauciflorae, ad 10 cm. longae; rachis capillacea; bracteae 1–3-florae; pedicelli 0.5–6 mm. longi; sepala 5, lanceolata, ca. 0.5 mm. longa, minute papillosa et parce hirsuta; ovarium muriculatum; styli 3-partiti, ad 4 mm. longi, ad basin 21-lacinulati; capsula ca. 2 mm. lata, muriculata.

Shrub, the stems slender, short pilose with antrorse hairs, greenish; leaves with petioles pubescent like the stems, up to 2.5 cm. long, slender, canaliculate, stipellate at base of blade on upper surface; leaf blade sparingly short pilose on undersurface, sparsely hispid above with short stiff mostly erect hairs, lanceolate, up to 12.5 cm. long, 4.3 cm. wide, apex acuminate, the base narrowed and rounded, the margin crenulate-denticulate, densely puncticulate over entire surface, 3-nerved at base, penninerved above with 6–9-pairs of slender arcuately ascending veins, these obscure above; stipules setose, rigid, pubescent; flowers monoecious in narrow axillary capillaceous panicles, appearing to be racemose, the rachis and pedicels short pilose with antrorse hairs, the flowers remote; bracts minute, 1–3-flowered, with slender unequal pedicels 0.5–6 mm. long; sepals 5, lanceolate, about 0.5 mm. long, acute, minutely papillose and sparsely hairy; ovary muriculate; style 3-parted to base, up to 4 mm. long, each part 7-laciniate; capsules 3-lobed, about 2 mm. wide, muriculate.

Mexico: Tamaulipas, Municipio de Gomez Farias, Sierra de Guatemala, 1000 m. east of road between San Pablo and the Red Gate along a trail leading into the lower region of mountain, in humid oak-sweetgum and semi-tropical evergreen transition zone, limestone topography, Sept. 4, 1970, *J. R. Sullivan 770* (TEX, type).

Referable to the subgenus *Linostachys*, section *Axillares*, *A. tamaulipasensis* has affinity to *A Schlechtendaliana* Muell. Arg. of Veracruz.

Alchornea integrifolia Pax & Hoffm., Pflanzenreich IV. 147, viii: 237. 1914.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, on top of hill, west of km. 159 of the Coban Road, Aug. 14, 1975, *C. L. Lundell & Elias Contreras 19636* (LL), shrub, 20 ft. high, 4 in. diam., staminate flowers greenish; Niño Perdido, west of km. 150/151, in high forest, Aug. 23, 1975, *Lundell & Contreras 19724* (LL), tree, 75 ft. high, 15 in. diam., fruits reddish-brown.

A poorly known species, the staminate inflorescence, not described previously, is solitary in the leaf axils, pinnately paniculate with slender rachis and branches, up to 13 cm. long and with peduncle up to 3 cm. long. The staminate flowers are glabrous, but the inflorescence is minutely pubescent with appressed stellate trichomes.

Bernardia albida Lundell, sp. nov. – Frutex, ad 3 m. altus; ramuli graciles, ramosi, juveniles stellato-tomentosi, mox glabrati; folia albida, petiolata, petiolo ad 1 cm. longo; lamina chartacea, utrinque stellato-pilosa, ovata vel orbiculari-obovata, ad 5.5 cm. longa, 4 cm. lata, apice rotundata, raro late obtusa vel emarginata, basi rotundata vel subtruncata, glanduloso-crenato-denticulata, basi glandulosa, 3- vel 5-nervia, nervis lateralibus 3- vel 4-jugis; stipulae ad 3 mm. longae; rami unisexuales; pedicelli fructiferi 1–1.5 cm. longi; bracteae late ovatae, ad 3.8 mm. longae, ciliatae, extus pubescentes; sepala 5, late ovata, ad 3 mm. longa, acuta, ciliata, extus dense pubescentia; columella ca. 6 mm. longa; styli profunde laciniati; capsula tricocca, ad 2 cm. lata, albida, dense stellato-tomentosa; semina ca. 8 mm. longa, carinata.

Shrub, up to 3 m. high, with slender rather short branches, or intricately branched, the branchlets at apex densely pilose-tomentose with stellate hairs, whitish, glabrate with age; leaves whitened with nerves slender but conspicuous beneath, petiolate, the petioles up to 1 cm. long, stellate-pubescent; leaf blades chartaceous, paler beneath, stellate-pilose with sessile short hairs, those of lower surface denser, ovate or orbicular-obovate, 2–2.5 cm. long, 1.5–4 cm. wide, the apex broadly obtuse, rounded or rarely emarginate, base broadly rounded or subtruncate, with conspicuous small rounded glands along margin at base and with larger plate-like glands scattered on blade above, the margin glandular-crenate-denticulate, the teeth irregular, the base 3- or 5-nerved, with 3 of nerves conspicuous, the primary lateral nerves above base 3 or 4 pairs; stipules rigid, narrowly lanceolate, up to 3 mm. long; flowers unisexual; infructescence with 1 fruit on stout pedicel 1–1.5 cm. long, the pedicel stellate-pubescent; bracts subtending fruits ovate, the central one up to 3.8 mm. long, acute, ciliate, the exterior pubescent; sepals 5, persistent, broadly ovate, up to 3 mm. long, acute, ciliate, densely pubescent on outside; disk annular; columella about 6 mm. high; style subappressed to capsule, deeply laciniate; capsule 3-lobed, up to 2 cm. wide, white tomentose with stellate hairs; seed about 8 mm. long, carinate.

Mexico: San Luis Potosi, 20 km. E of San Francisco on San Luis

Potosi-Rioverde Highway, on dark limestone, alt. 1600 m., July 1, 1972, *F. Chiang, T. Wendt & M. C. Johnston 8183* (LL, type), shrub, to 3 m.

Another collection, an intricately branched shrub, *M. C. & L. A. Johnston 7243* (TEX), from Hidalgo is referable to *B. albida*. It is likewise in fruit.

Perhaps related to *B. mexicana* (Hook. & Arn.) Muell. Arg., a complex badly in need of field study and revision. The infructescence of *B. albida* bears a single capsule in all material seen. This species is well-marked further by its dense whitish stellate-pilose indument, and numerous glands at base and above on leaf blade.

Bernardia aurantiaca Lundell, Wrightia 1: 57. 1945.

British Honduras: El Cayo District, Chalillo Crossing, in high forest on hillside, July 15, 1936, *C. L. Lundell 6509* (LL, type), tree, 10 m. high, 10 cm. diam., cambium bright orange.

The species is represented in the Lundell Herbarium by a series of collections from British Honduras, Peten and Campeche. This appears to be the taxon that was reported in the *Flora of Guatemala* [Fieldiana: Bot. 24(6): 52. 1949] as *B. interrupta* (Schl.) Muell. Arg., described from Veracruz. *B. aurantiaca* differs in its smaller staminate flowers twice as numerous in a bract, lanceolate acuminate leaves, more numerous plate-like glands at base of leaf blade and scattered along margin to apex, and somewhat finer indument.

Bernardia chiapensis Lundell, sp. nov. — Frutex 3–4 m. altus, ramulis stellato-tomentosis, crassiusculis; folia petiolata, petiolo 1–1.4 cm. longo; lamina chartacea, lanceolata, 5–9.5 cm. longa, 2–4.5 cm. lata, apice acuta vel acuminata, basi rotundata, 3-nervia, utrinque stellato-puberula, serrulato-denticulata, nervis lateralibus 3- vel 4-jugis; flores staminati spicati; spicae axillares, 1–3 cm. longae, minute stellato-tomentosae; pedicelli ca. 1 mm. longi; sepala 3, ovata, 3 mm. longa, acuta, puberula; stamina 14 vel 15, ca. 3 mm. longa; flores pistillati ignoti.

Shrub, up to 4 m. tall, the branchlets rather short and thick, stellate-tomentose; stipules linear-lanceolate, up to 3 mm. long; leaves petiolate, the petioles 1–1.4 cm. long, minutely stellate tomentose like the blade; leaf blades firmly chartaceous, lanceolate, 5–9.5 cm. long, 2–4.5 cm. wide, apex acute or short acuminate, base rounded, 3-nerved, with scattered plate-like glands on blade beneath, the margin serrulate-denticulate, the teeth conspicuous, marginally thickened, the primary lateral veins usually 3- or 4-pairs, slender; flowers in unisexual spikes, the staminate axillary, 1–3 cm. long, stout, bracteate almost to base, minutely stellate-tomentose; bracts 1- or 2-flowered, broadly depressed-ovate, thickish, 2 mm. long, acutish, minutely tomentose; pedicels short, about 1 mm. long; sepals 3, thin, ovate, 3 mm. long, valvate in bud, puberulent on both surfaces; stamens 14 or 15; filaments slender, about 3 mm. long, glabrous; anthers minute, longitudinally dehiscent; pistillate flowers and fruits unknown.

Mexico: Chiapas, Boqueron, near Motozintla, alt. 2540 m., May 4, 1945, *Eizi Matuda 5390* (LL, type), shrub, 3–4 m. high.

B. chiapensis is related to *B. oblanceolata* Lundell, also of Chiapas, but appears to differ in its lanceolate leaves, smaller bracts of staminate

flowers, these only 1- or 2-flowered, short pedicels only about 1 mm. long, and smaller sepals. *B. mexicana* (Hook. & Arn.) Muell. Arg. is known to me only from description and type photograph, and *B. chiapensis* closely resembles that poorly known taxon.

Bernardia mayana Lundell, sp. nov. – Frutex; ramuli graciles, novelli stellato-pubescentes; folia petiolata, petiolo 0.5–2 cm. longo; lamina subchartacea, lanceolata, lanceolato-oblonga vel oblanceolato-elliptica, 3.5–10 cm. longa, 2–3.5, raro 4.5 cm. lata, apice acuta vel rotundata, raro subacuminata, basi rotundata, irregulariter serrulata, supra et subtus juventate parce et minute stellato-pubescentia, mox scabridula, subtus pauciglandulosa, basi 3- vel 5-nervia; stipulae lanceolatae, ca. 2 mm. longae; flores pistillati spicati; spicae axillares, ad 6.5 cm. longae, stellato-pubescentes; pedicelli fructiferi subnulli; sepala ovata, acuta, ad 2.5 mm. longa; capsula 3-lobata, stellato-hirsuta, ca. 1.2 cm. diam.

Shrub, about 4 m. high, 5 cm. diam., the branchlets slender, rather short, at first stellate-pubescent, the longer hairs subappressed, antrorse; leaves green, paler beneath, usually short petiolate, the petioles slender, canaliculate, 0.5–2 cm. long; leaf blades thin, subchartaceous, lanceolate-oblong, oblanceolate-elliptic or sometimes obovate, 3.5–10 cm. long, 2–3.5, rarely 4.5 cm. wide, apex acute or rounded, rarely acuminate, base rounded, the margin inconspicuously serrulate or irregularly serrulate with alternate teeth smaller, both surfaces at first rather sparsely and minutely stellate-pubescent, slightly scabridulous above at maturity, usually with 4 or 5 small round glands on blade beneath above base, the base 3- or 5-nerved, and primary lateral veins slender, 3 to 5 pairs, inconspicuous, arcuate and ascending at a rather sharp angle; stipules narrowly lanceolate, about 2 mm. long; flowers dioecious; pistillate flowers spicate, the inflorescences axillary and apparently terminal, mostly less than 3 cm. long, sometimes up to 6.5 cm. long, stellate-pubescent; fruiting pedicels very short, the capsules appearing to be sessile along the rachis; sepals and bracts ovate, acute, up to 2.5 mm. long, densely appressed pubescent on outer surface, glabrous on inner; capsules deeply 3-lobed, about 1.2 cm. in diam., the lobes rounded, stellate-hirsute.

Guatemala: Dept. Peten, Dos Lagunas, Ixcanrio, Bajo Ixcanrio, in *tintal* 2 km. west, May 16, 1969, *Elias Contreras 8575* (LL, type), shrub, 12 ft. high, 2 in. diam.

The species is related to *B. yucatanensis* Lundell. Material of both is inadequate, and the taxa of this complex are poorly understood. *B. mayana*, a swamp species, is different in aspect with its narrower oblongish less pubescent thin leaves, slender petioles, and leaf margin usually inconspicuously serrulate. In *B. yucatanensis* the leaves are mostly ovate, with coarse reticulate venation, and quite scabrous.

Bernardia ovalifolia Lundell, sp. nov. – Frutex, ca. 2 m. altus; ramuli fulvo-stellato-tomentosi, graciles; folia parva, stellato-pubescentia, petiolata, petiolo 3–7 mm. longo; lamina chartacea vel subcoriacea, ovalia vel late ovato-elliptica, 2.5–6.5 cm. longa, 2–4 cm. lata, apice rotundata, obtusa vel acutiuscula, basi rotundata, 3-nervia, minute serrulata, supra subbullata, nervis lateralibus 3–5-jugis; flores staminati ignoti; flores

pistillati spicati; spicae terminales usque ad 1.5 cm. longae, fulvo-tomentosae, floribus sessilibus 2 vel 3, bracteis 2- vel 3-dentatis, ad 2.5 mm. longis, apice subacuminatis; bracteolis ovatis, ad 2 mm. longis, acuminatis; sepala 4–6, biseriata, exteriora lanceolata, ca. 2.5 mm. longa, 1.5 mm. lata, interiora parva, lanceolata, ca. 2 mm. longa, 1 mm. lata; discus cupulatus, glaber; ovarium 3-lobatum, fulvo-tomentosum; styli laciniati, basi hirsuti.

Shrub, about 2 m. tall, all parts fulvous-tomentose with fine stellate hairs, those of the upper leaf surface minute; branchlets slender, rather short; leaves small, fulvous, short petiolate, the petioles 3–7 mm. long, with short lanceolate stipules at base; leaf blades firmly chartaceous or subcoriaceous, oval or broadly ovate-elliptic, up to 6.5 cm. long, 4 cm. wide, apex usually rounded, sometimes obtuse or acutish, 3-nerved at base, apparently eglandular, the margin closely serrulate with sharp teeth, subbullate above, the lateral nerves 3–5-pairs, elevated like the midvein beneath, the veins conspicuous; pistillate flowers in short terminal spikes up to 1.5 cm. long, the flowers sessile, 2 or 3 in a spike; bracts broad, up to 2.5 mm. long, 2- or 3-dentate, subacuminate at apex; bractlets smaller; sepals 4–6, biseriate, the exterior larger, lanceolate, up to 2.5 mm. long, 1.5 mm. wide, the smaller interior ones similar, about 2 mm. long, 1 mm. wide; disk thin, cupulate, irregular, glabrous; ovary shallowly 3-lobed, fulvous-tomentose; style 3-parted, thick and hirsute at base, with slender short branches.

Mexico: Durango, Corral de Piedra, alt. 4000 ft., April 10, 1943, *C. L. Lundell 13002* (LL, type), shrub, 6 ft. high.

B. ovalifolia may have affinity to *B. Wilburi* McVaugh of Jalisco. The 4–6 biseriate sepals, oval leaves subbullate and persistently stellate-puberulent above, and the absence of glands on lower leaf surface are features which appear to distinguish *B. ovalifolia*. The small, sharp and crowded teeth of the leaf margin are to be noted. The absence of leaf glands is atypical of this genus.

Hieronyma Gentlei Lundell, sp. nov. — Arbor, ramulis minute et dense lepidotis; folia petiolata, petiolo 1.3–2.5 cm. longo; lamina chartacea, novella utrinque parce lepidota, anguste elliptica vel oblanceolata, 8–13 cm. longa, 3–4.2 cm. lata, apice acuminata, acumine apiculato, basi subcuneata, nervis lateralibus 7- vel 8-jugis; inflorescentia axillaris, paniculata, ca. 5 cm. longa, dense et minute lepidota; flores pistillati pedicellati; pedicelli 1–2 mm. longi; calyx minute 5-dentatus; ovarium glabrum.

Tree, 20 cm. in diameter; branchlets slender, angulate, densely lepidote with minute pale-brown scales; leaves with slender canaliculate petioles 1.3–2.5 cm. long, densely lepidote like the branchlets; leaf blades chartaceous, paler beneath, at first with scattered small scales on both surfaces, nearly glabrous at maturity except along the midvein beneath, narrowly elliptic, lanceolate or oblanceolate, 8–13 cm. long, 3–4.2 cm. wide, apex acuminate, the acumen sharply apiculate, base acute or subcuneate, the midvein elevated beneath, nearly plane above, the primary lateral veins slender and inconspicuous, mostly 7- or 8-pairs, the veins

inconspicuously reticulate; pistillate inflorescence axillary, paniculate, about 5 cm. long, with short peduncle, densely lepidote; pedicels short, 1–2 mm. long; calyx small, minutely 5-dentate, lepidote; ovary ovoid, glabrous.

British Honduras: Toledo District, between Rancho Chico and Cockscomb, Monkey River, in forest, March 30, 1943, *Percy H. Gentle 4364* (LL, type), tree, 8 in. diam.

H. Gentlei may have affinity to *H. oblonga* (Tul.) Muell. Arg., but it does not resemble collections, presumably of this taxon, from Costa Rica and Panama. The slender mostly narrowly elliptic, conspicuously acuminate, rather thin leaves, and glabrous ovary contrast with the obovate abruptly short acuminate leaves and lepidote ovary of *H. oblonga* in southern Central America.

Hieronyma ovatifolia Lundell, Wrightia 4: 134. 1970.

Guatemala: Dept. Peten, Los Arcos, km. 146 of the Cadenas Road, in high forest, east, Dec. 20, 1969, *Elias Contreras 9413* (LL, type), tree, 100 ft. high, 25 in. diam., fruit pink or reddish. Dept. Izabal, in high forest, between Seja and Cienaga, 5 km. from Seja, 200 m. east of Rio Dulce Road, July 12, 1970, *Contreras 10202* (LL), *10212* (LL), tree, 90–100 ft. high, 30 diam., fruit pinkish.

British Honduras: Toledo District, in high ridge, on hill slope beyond Central Camp, Edwards Road beyond Columbia, April 2, 1951, *Percy H. Gentle 7265* (LL), tree, 6 in. diam., (sterile specimens).

H. ovatifolia appears to be closely related to *H. alchorneoides* Allem. The petioles of the stipules often exceed the blades.

STAPHYLEACEAE

Turpinia paucijuga Lundell, sp. nov. – Arbor; ramuli crassiusculi; folia pinnata, paucijuga, petiolata, petiolo usque ad 7 cm. longo; foliola glabra, coriacea, 3 vel 5, raro 2, lanceolata vel ovata, 4–15 cm. longa, 1.5–6.5 cm. lata, apice subabrupte acuminata, basi rotundata, serrulata; infructescentia 3–9 cm. longa, anguste paniculata; pedicelli crassi, ad 8 mm. longi, sepala ad 4 mm. longa; flores ignoti; drupa triangularia, ad 2.5 cm. longa, carnosa.

Tree with rather stout branchlets, apparently glabrous; leaves pinnate, petiolate, the petioles up to 7 cm. long; leaflets 3 or 5, sometimes 2, glabrous, coriaceous, inconspicuously veined, lanceolate or ovate, 4–15 cm. long, 1.5–6.5 cm. wide, apex subabruptly acuminate, base rounded, the margin serrulate above the base; fruiting panicles narrow, up to 9 cm. long, with thick rachis and branches; pedicels thick, up to 8 mm. long; flowers unknown; drupes fleshy, triangular or shallowly tricornute, up to 2.5 cm. long, 2.8 cm. wide, glabrous.

Guatemala: Dept. Baja Verapaz, in high forest on top of hill, west of km. 153/154 of the road, Aug. 16, 1975, *C. L. Lundell & Elias Contreras 19661* (LL, type), tree, 75 ft. high, 18 in. diam., fruit brownish.

T. paucijuga is related to *T. tricornuta* Lundell, a species of higher elevations, with 5 or 7 leaflets and conspicuously tricornute fruits.

GUTTIFERAE

Clusia mayana Lundell, sp. nov. — Arbor glabra; ramuli crassi; folia glabra, late petiolata, petiolo lato, ca. 1 cm. longo; lamina rigide coriacea, obovata, ad 15 cm. longa, 9.5 cm. lata, apice rotundata vel obscure emarginata, basi late cuneata, utrinque prominenter costata, venis lateralibus multijugis, utrinque prominulis; flores unisexuales; inflorescentia paniculata, pedunculata, nodulis bibracteatis. *Flores masculi* ad 20, sepalis 4, ad 8 mm. longis, petalis 5, ad 1.8 cm. longis, staminibus ca. 50, 8–9 mm. longis, antheris ca. 4 mm. longis quam filamentis subaequalibus. *Flores feminei* 3–7, raro 1; pedicelli ad 10 mm. longi; sepala 4, ad 8 mm. longa; petala 5, 1.7–1.8 cm. longa; staminodia parva, ca. 1.5 mm. longa, apiculata; ovarium globosum, 5-loculare; stigma 5, carnosa, crenulata.

Tree, up to 16 m. tall, 30 cm. in diam., entirely glabrous; branchlets thick; leaves rigidly coriaceous, much paler beneath, the base marginate with broad thick canaliculate petiole mostly about 1 cm. long, up to 1 cm. wide; leaf blades obovate, mostly 10–15 cm. long, sometimes smaller, mostly 4.5-9.5 cm. wide, apex broadly rounded, sometimes rather obscurely truncate-emarginate, base broadly cuneate, the midvein elevated beneath, the lateral veins slender, numerous, equally conspicuous on both surfaces; flowers unisexual; inflorescence paniculate, long pedunculate, pyramidal, the flowers of both sexes ternate, with a pair of rounded coriaceous bracts at each node, the lower bracts about 5 mm. long; peduncle stout, elongate in both sexes, mostly 3–7 cm. long, without bracts. *Staminate flowers* up to 20 in inflorescence, the panicles open with lower branches up to 2 cm. long, the pedicels thick, 2–5 mm. long, sometimes shorter, with a pair of bractlets at base of each ternate cluster; calyx subtended by single pair of opposite bractlets, the bractlets rounded, thick, 4–5 mm. long, keeled, clasping; sepals 4, coriaceous, subequal, broadly ovate-rounded, 6–8 mm. long; petals 5, free, oblong-elliptic or obovate-elliptic, up to 1.8 cm. long; stamens about 50, 8–9 mm. long, the anthers subequalling or slightly shorter than the thick filaments. *Pistillate flowers* usually 3, sometimes 5 or 7, rarely 1, with thick peduncles and pedicels; the secondary branches of inflorescence bibracteate above middle, the pedicels up to 10 mm. long, mostly shorter; base of flower bibracteolate; sepals 4, broadly ovate-rounded, up to 8 mm. long; petals 5, elliptic or obovate-elliptic, 1.7–1.8 cm. long, rounded at apex; staminodia fleshy, united below, about 1.5 mm. long, ovate, abruptly apiculate; ovary globose; 5-loculate; stigmas 5, sessile, fleshy, with crenulate margin.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, west of km. 139, bordering road, Sept. 18, 1975, *C. L. Lundell & Elias Contreras 19867* (LL, type), small tree, 20 ft. high, 3 in. diam., pistillate flowers yellow-green, fragrant; La Cumbre, in *zapotal* on top of hill, west of the village, about 6 km. on Sapurul Road, Sept. 13, 1975, *Lundell & Contreras 19860* (LL), tree, 50 ft. high, 12 in. diam., corolla of staminate flowers yellow-green; La Cumbre, in *zapotal* on top of hill, west of km. 139, bordering the road, Sept. 18, 1975, *Lundell & Contreras 19870* (LL), tree, 30 ft. high, 6 in. diam., staminate flowers yellow-green.

Related to *C. Massoniana* Lundell, *C. mayana* differs in having anthers subequalling filaments, conspicuously pedicellate staminate flowers, and larger petals.

THYMELAEACEAE

Daphnopsis strigillosa Lundell, sp. nov. – Frutex vel arbor parva; ramuli dense strigillosi, graciles; folia strigillosa, petiolata, petiolo 3–6 mm. longo, raro ad 1 cm. longo; lamina membranacea, lanceolata vel elliptica, 6–10 cm. longa, 2.3–4.5 cm. lata, raro ad 15 cm. longa, 6 cm. lata, apice acuminata, basi acuta, nervis lateralibus 5–8-jugis; inflorescentia multiflora, strigillosa, longe pedunculata; flores unisexuales; pedicelli 2–2.5 mm. longi. *Flores masculi* ad 10.5 mm. longi; petala nulla. *Flores feminei* ad 5.2 mm. longi; petala nulla; staminodia 8, papilliforma; drupa ovoidea, ca. 1 cm. longa, apice strigillosa.

Shrub, or tree to 11 m. high, 10 cm. diam.; branchlets slender, rather short, persistently strigillose; leaves strigillose on both surfaces, thin, membranaceous, petiolate, the petioles usually 3–6 mm. long, sometimes up to 1 cm. long, strigillose; leaf blades slightly paler beneath, lanceolate or elliptic, usually 6–10 cm. long, 2.3–4.5 cm. wide, sometimes up to 15 cm. long, 6 cm. wide, apex acuminate or subabruptly acuminate, base acute and decurrent on petiole, the midvein elevated beneath, narrowly impressed above, the primary lateral veins slender, 5–8 pairs, arcuately ascending; flowers unisexual. Staminate inflorescence strigillose, the primary peduncle 1.5–3 cm. long, the secondary peduncles 4–6 mm. long. *Staminate flowers:* up to 30 or more per umbel; pedicels up to 2 mm. long; calyx tube obconic-tubular, 8–9 mm. long, up to 3 mm. wide at the orifice, strigillose without, glabrous within; calyx lobes rounded, about 1.5 mm. long, glabrous within; petals absent; upper stamens inserted below the orifice, the lower about 2 mm. below attachment of those above; anthers sessile, oblong; disc cupuliform, free, about 0.5 mm. tall, glabrous, more or less lobed, sometimes to base; ovary setose above. Pistillate inflorescence strigillose, the primary peduncle 2.5–4 cm. long, the secondary peduncles 4–5 mm. long. *Pistillate flowers:* numerous per umbel; pedicels up to 2.5 mm. long; calyx tube strigillose, narrowly urceolate, about 4 mm. long; sepals ovate, subequal, about 1.2 mm. long, glabrous within; petals absent; staminodia 8, papilliform, very inconspicuous; disc cupuliform, free, about 0.4 mm. high, subentire, glabrous; ovary setose at apex; stigma exserted; drupe ovoid, about 1 cm. long, black.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, northwest of km. 159 of Coban Road, June 12, 1975, *C. L. Lundell & Elias Contreras 19437* (LL, type), shrub, 12 ft. high, 2 in. diam., pistillate flowers and green fruit; Union Barrios, in high forest on top of hill, east of km. 154, June 8, 1975, *Lundell & Contreras 19393* (LL), tree, 35 ft. high, 4 in. diam., staminate flowers yellow-green; same general locality, *Lundell & Contreras 19403* (LL), *19624* (LL), *19659* (LL), and *19665* (LL).

On the basis of floral structure, *D. strigillosa* appears to be related to *D. Selerorum* Gilg, a species of the mountains of Guatemala and El

Salvador. The persistent strigillose indument of all parts, elongate primary peduncle of staminate flowers, longer calyx tube in staminate flowers, and flowers of both sexes with well-developed pedicels 2–2.5 mm. long significantly distinguish the taxon.

MYRSINACEAE

Ardisia tacarcunana Lundell, sp. nov. — Arbor parva; ramuli graciles, adpresse lepidoti; folia petiolata, petiolo 4–10 mm. longo; lamina chartacea, puncticulosa, elliptica, 8.5–14 cm. longa, 4–6 cm. lata, apice acuminata, basi acuta, subintegra, nervis lateralibus 11–13-jugis; inflorescentia terminalis, paniculata, pauciramosa, ad 6 cm. longa; flores corymbosi; pedicelli 4.5–6 mm. longi; sepala 5, ca. 1.2 mm. longa, dense punctata; corolla ca. 5.5 mm. longa, lobis 5, lanceolatis, ca. 4 mm. longis; stamina 5, ca. 4 mm. longa; antherae lanceolato-oblongae, 2.5 mm. longae; ovarium glabrum.

Tree, 5 m. tall, the branchlets slender, minutely lepidote at first with closely appressed scales, brownish; leaves sparsely but persistently lepidote beneath, especially along the elevated costa and petiole, the petioles marginate, 4–10 mm. long; leaf blades chartaceous, densely puncticulate, elliptic, 8.5-14 cm. long, 4–6 cm. wide, apex subabruptly acuminate, base acute and decurrent, the margin subentire, midvein nearly plane above, the primary lateral veins slender, 11–13-pairs, rather inconspicuous; inflorescence terminal, paniculate, up to 6 cm. long, with only 2 or 3 short branches, minutely brown-lepidote; flowers few, corymbose; pedicels slender, 4.5–6 mm. long; sepals 5, ovate-lanceolate, about 1.2 mm. long, acutish, erose, densely punctate with raised glands; corolla about 5.5 mm. long, with cylindrical tube about 1.5 mm. long, the 5 lobes lanceolate, about 4 mm. long, lineate; stamens 5, about 4 mm. long, with slender filaments about 1.8 mm. long attached medially in tube; anthers basifixed, lanceolate-oblong, about 2.5 mm. long, dehiscent by apical pores; ovary ovoid, glabrous, the slender style about 4.5 mm. long.

Panama: Darien, south slope of west peak of Cerro Tacarcuna massif, 1500–1800 m., lower montane wet forest, high canopy 25-30 m., Jan. 28, 1975, *Al Gentry & S. Mori 13963* (MO, type; LL, isotype), tree 5 m., flowers white, anthers yellow.

The taxon is closely related to *A. geniculata* Lundell of Chiriqui. *A. tacarcunana* has a greatly reduced terminal inflorescence with only 1 to 3 short branches, shorter pedicels, and larger elliptic leaves. The scales are brownish and so small and closely appressed that they are inconspicuous.

SAPOTACEAE

Calocarpum Cooperi (Cronquist) Lundell, comb. nov. *Pouteria Cooperi* Cronquist, Lloydia 9: 291. 1946.

Calocarpum fossicolum (Cronquist) Lundell, comb. nov. *Pouteria fossicola* Cronquist, Lloydia 9: 289. 1946.

Calocarpum sclerocarpum (Pittier) Lundell, comb. nov. *Lucuma sclerocarpa* Pittier, Contr. U. S. Nat. Herb. 18: 166. 1916. *Pouteria sclerocarpa* (Pittier) Cronquist, Lloydia 9: 287. 1946.

Manilkariopsis lobulata Lundell, sp. nov. – Arbor; ramuli crassiusculi, glabrati; folia longe petiolata, petiolo 1.5–3.5 cm. longo, canaliculato; lamina coriacea, glabrata, oblanceolata vel oblongo-elliptica, raro obovata, 8–17 cm. longa, 3–6 cm. lata, apice subabrupte acuminata, acumine obtuso vel obtusiusculo, basi acuta vel late cuneata; flores 6-meri, solitarii, axillares; pedicelli adpresse tomentelli, 1.5–2 cm. longi; sepala 6, subequalia, biseriata, exteriora adpresse tomentella, ovata, ad 8 mm. longa, 5.5 mm. lata, obtusiuscula, interiora elliptica, apice rotundata, late apiculata; gamopetala; corolla glabra, 9–10 mm. longa, urceolata, tubus ad 5.5 mm. longus; petala apice minute 3-lobulata, lobo medio elliptico, 0.5–1 mm. longo; staminodia petaloidea, glabra; stamina ca. 3 mm. longa; filamenta subulata; antherae lanceolatae, ca. 2 mm. longae, apiculatae; ovarium 8-loculare, hirsutum; stylus crassus, 6.5 mm. longus; fructus ovoideus vel subglobosus, 3–4 cm. longus; semina obovoidea vel oblique elliptico-obovoidea, 1.8–2 cm. longa, compressa, apice rotundata, basi acuta.

Tree, up to 26 m. tall, 50 cm. diam.; branchlets rather slender, glabrate; leaves large, the petioles slender, canaliculate, up to 3.5 cm. long, with scattered appressed pubescence; leaf blades coriaceous at maturity, glabrous except along the midvein, oblanceolate or oblong-elliptic, rarely obovate, 8–17 cm. long, 3–6 cm. wide, apex subabruptly acuminate, the acumen obtuse or obtusish, mostly short and broad, base acute or broadly cuneate, the midvein elevated beneath, narrowly sulcate above, with narrow medial ridge, the veins and veinlets very slender, obscure; flowers 6-parted, solitary in leaf axils, sometimes appearing fasciculate at apex of branchlets; pedicels densely appressed pubescent, 1.5–2 cm. long; sepals 6, subequal, biseriate, the 3 exterior appressed pubescent, ovate, up to 8 mm. long, 5.5 mm. wide, obtusish, the interior of equal size, elliptic, rounded and broadly apiculate at apex; gamopetalous; corolla glabrous, 9–10 mm. long, urceolate, the tube leathery, up to 5.5 mm. long; petals minutely lobulate at apex or occasionally subentire, the lateral lobes triangular, cuspidate, shorter than middle lobe, the middle lobe broadly elliptic or rounded, only 0.5–1 mm. long, distinct; staminodia petaloid, lanceolate, equalling lateral lobes of petals, connate at base to edges of petals, the apex narrow, erose; stamens about 3 mm. long, glabrous; filaments subulate, incurved; anthers lanceolate, apiculate, fully 2 mm. long; ovary with broad disk at base, hirsute, 8-loculate; style thick, glabrous, 6.5 cm. long; fruits brownish, scurfy, ovoid or subglobose, 3–4 cm. long; seed narrowly obovoid or obliquely elliptic-obovoid, 1.8–2 cm. long, compressed, apex rounded, base acutish, without dorsal fold; seed-scar basilateral, linear, 1.5–1.7 cm. long, 1–1.5 mm. wide, not beaked at apex.

Guatemala: Dept. Peten, in clearing, bordering Lake Macanche, April 20, 1975, *C. L. Lundell & Elias Contreras 19228* (LL, type), tree, 80 ft. high, 20 in. diam., flowers white, fruits brownish, "*chico zapote*."

In *Manilkariopsis* the species is unique in having petals with the three apical lobes only 0.5 to 1 mm. long, the lateral shorter than the middle lobe and mostly triangular and cuspidate. The middle lobe is elliptic and rounded, always longer than the lateral lobes (appendages). *M. lobulata* is related to *M. petenensis*, but differs in its minute petal lobes, and seed without basal fold on dorsal edge, and with elongate seed-scar up to seven-eights the length of seed.

Some petals in *M. lobulata* appear to be subentire, but the outline of the middle lobe is evident even in those where it is not free.

Peteniodendron Lundell, gen. nov. — Arbores pubescentes; folia chartacea vel coriacea, venis primariis tenuibus crebris parallelis vel magis dissitis subtusque prominulis; flores parvi, 5-meri, raro 4-meri, unisexuales vel pseudohermaphroditi, ad axillas vel nodos defoliatos fasciculati, sessiles vel pedicellati. *Flores staminati* pseudohermaphroditi; sepala imbricata, pubescentia, subaequalia; corolla gamopetala, petala 5, raro 4, tubo brevi subcylindraceo-campanulato; stamina 5, raro 4, tubo corollae affixa et petala opposita; filamentis brevibus; antherae oblongae vel ovato-ellipticae, apiculatae, loculis extrorsum dehiscentibus; staminodia petaloidea, parva; ovarium hirsutum, 2- vel 3-loculare, abortivum. *Flores pistillati* unisexuales, parvi; sepala imbricata; corolla gamopetala; stamina nulla, vel abortiva; staminodia subnulla, vel abortiva; ovarium hirsutum, 2- vel 3-loculare; stylus crassus; stigma lobata. *Bacca* ovoidea vel subglobosa; semina 1 vel 2; area derasa late elliptica, longitudine seminis; endosperma nulla.

Type species: *Peteniodendron belizense* Lundell.

The Department of Peten is covered with one of the richest sapotaceous forests in the neotropics, and the genus commemorates the name of that remote region of Guatemala. In this forest the ancient Maya developed the greatest centers of their civilization.

Peteniodendron is remarkable for its heteromorphic unisexual flowers. The complete suppression of the stamens and the reduction of the staminodia to vestiges in the pistillate flowers of the generic type, *P. belizense*, represent the extreme in the reduction of floral parts in this species complex. Other distinguishing generic features of this type are the small size of the pistillate flowers, compared with the staminate, 2- or 3-loculate ovary, and small pubescent fruits with large maculate seed-scar.

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Peteniodendron belizense Lundell, sp. nov. — Arbor; ramuli crassiusculi, adpresse rufo-pubescentes; folia glabrata, coriacea, petiolata, petiolo 1–2.5 cm. longo; lamina oblanceolata vel obovata, raro elliptica vel anguste elliptica, 10-15 cm. longa, raro ad 30 cm. longa, 3.5–7 cm. lata, raro ad 11 cm. lata, undulata, apice subabrupte acuminata, acumine ad 2 cm. longo, nervis lateralibus 9–11-jugis; flores unisexuales, 5-meri, fasciculati, sessiles vel subsessiles. *Flores staminati* pseudohermaphroditi; sepala imbricata, adpresse rufo-pubescentia, exteriora ovata vel ovato-oblonga, 3–3.5 mm., raro ad 4.8 mm. longa, ad 2.5 mm. lata, interiora subaequalia, oblongo-elliptica; corolla gamopetala, 4–5 mm. longa, tubus 1.2–2 mm. longus; petala late ovata, 2–3.2 mm. longa, 3–3.8 mm. lata,

apice acutiuscula vel rotundata; filamenta subulata, 1–1.7 mm. longa; antherae oblongae vel ovato-ellipticae, ca. 1.3 mm. longae, apiculatae; staminodia petaloidea, parva, ovata, ca. 1.2 mm. longa, erosa, lobata, apice acuminata; ovarium hirsutum, 2-loculare, abortivum. *Flores pistillati* parvi; sepala imbricata, rufo-pubescentia, carnosa, ovata vel late ovata, 2–2.4 mm. longa; corolla gamopetala, glabra, 3–3.4 mm. longa; tubus 1.5–1.7 mm. longus; petala exserta, late ovata; stamina nulla; staminodia abortiva; ovarium hirsutum, ca. 1 mm. longum, 2-loculare; stylus crassus; stigma bilobata. *Fructus* obovoideus vel subglobosus, 1.2–2.5 cm. longus; semina 1 vel 2; area derasa late elliptica.

British Honduras: El Cayo District, in cohune ridge, base of hill, Humming Bird Highway, April 20, 1955, *Percy H. Gentle 8679* (LL, type), flowers (staminate) white, scented, "*mammy cedrela.*"

Guatemala: Dept. Peten, Tikal, on trail to Uaxactun Bajo, April 7, 1959, *C. L. Lundell 15868* (LL), tree, 13 in. diam., 30 ft. high, flowers (staminate) white; Tikal, in *ramonal* on the ruins, March 9, 1960, *Lundell 16759* (LL), tree, 3 in. diam., 20 ft. high, petals white (staminate flowers); San Pedro, on Cadenas Road, in high forest, bordering river, Jan. 8, 1970, *Elias Contreras 9472* (LL), small tree (pistillate flowers), "*zapotillo blanco.*" Dept. Izabal, Puerto Mendez (Cadenas), in low forest, bordering Rio Sarstun, 3 km., March 21, 1967, *Contreras 6812* (LL), tree, 45 ft. high, 8 in. diam., fruit dark green, "*zapotillo.*"

I described this taxon in detail as *Pouteria Durlandii* (Standl.) Baehni in Wrightia 5: 96. 1975, based upon the collections cited above, excluding type of *Pouteria Durlandii.*

Peteniodendron Durlandii (Standl.) Lundell, comb. nov. *Lucuma Durlandii* Standl., Trop. Woods 4: 5. 1925. *Pouteria* (?) *Durlandii* (Standl.) Baehni, Candollea 9: 422. 1942. *Paralabatia Durlandii* (Standl.) Aubr., Adansonia, new ser. 3: 21. 1963.

Guatemala: Dept. Peten, El Paso, *W. D. Durland s.n.* (US, type), fruit on short stalks issuing from main twigs, ½–¾ in., ovoid, latex white.

No less than six species in the Sapotaceae have been described from our area based on sterile material or otherwise unsatisfactory specimens impossible to identify with any degree of authority. In his review of the taxonomic problem, Louis O. Williams stated: ....."because the type of this species *(Pouteria Durlandii)* is essentially sterile and that of *Pouteria izabalensis* is sterile there can be no assurance as to what they represent and perhaps would be best treated as *nomina dubia*" (Fieldiana: Bot. 31: 263–264. 1967). Nevertheless Williams followed Cronquist and included both taxa in the *Flora of Guatemala* [Fieldiana: Bot. 24 (8): 236-237. 1967]. I have studied both types, and I concur in Williams conclusion that they should be considered *nomina dubia.*

Regardless of our conclusions, the species name *Pouteria* (?) *Durlandii* (Standl.) Baehni probably will continue in use on the basis of historical precedent. Hence, I am placing the taxon in *Peteniodendron,* for its leaves are of the *P. belizense* type.

Peteniodendron potosinum (Lundell) Lundell, comb. nov. *Pouteria potosina* Lundell, Wrightia 5: 101. 1975.

This species is the northernmost representative of the complex, notable for floral differences (l.c., p. 103) from *P. belizense* which it rather closely resembles in leaf type.

APOCYNACEAE

Fernaldia glabra (Molina) Lundell, comb. nov. *Fernaldia pandurata* (A.DC.) Woodson var. *glabra* A. Molina, Ceiba 3: 95. 1952.

Guatemala: Dept. Izabal, Puerto Mendez (Cadenas), in high forest, on top of rocky hill, Aug. 8, 1966, *Elias Contreras 5925* (LL), vine, flowers greenish. Dept. Peten, San Pedro, km. 160 of Cadenas Road, in low forest on rocky hill, Aug. 12, 1967, *Contreras 7008* (LL), vine, flowers white-yellowish.

This essentially glabrous plant differs from *F. pandurata* in features other than lack of pubescence, and might best be afforded specific rank. Its much longer pedicels, sometimes exceeding 2 cm. even in bud, smaller ciliolate calyx lobes sharply acute or acuminate and reflexed apically, and the corolla larger in all parts are differences at once apparent. The anthers reach 9 mm. in length, while those of *F. pandurata* are described as 6 mm. long. Significantly, the nectaries are either 4- or 5-lobed, not strictly 4-lobed as in other species of the genus.

Laubertia Gentlei Lundell, sp. nov. — Fruticosa, volubilis, ramulis gracilis, breviter villosis; folia opposita, breviter villosa, petiolata, petiolo 1.2–2.5 cm. longo; lamina chartacea, supra glabrata, subtus breviter subadpresse villosa, ovata vel oblongo-elliptica, ad 14 cm. longa, 6.5 cm. lata, apice subabrupte caudato-acuminata, basi rotundata, subcordata; inflorescentia simplicia vel di- vel tri-dichotoma, ad 7 cm. longa, dense et minute subadpresse villosa, apice densiflora, corymboso-racemosa; bracteae lineari-oblanceolatae, ad 1.1 cm. longae, 1.8 mm. latae; pedicelli 6–12 mm. longi; sepala lineari-oblanceolata, ad 8 mm. longa, subadpresse hirtella; corollae salverformis, extus minute strigillosae, tubo ca. 2.2 cm. longo, prope medium paulo contorto, lobis oblique oblanceolatis, ca. 7 mm. longis; filamenta 1 mm. longa, parce villosa; antherae ca. 4 mm. longae, basi late auriculatae, apice acuminatae; nectariis 5; ovarium glabrum; folliculis ad 27 cm. longis, breviter villosis; pedicelli fructiferi 1.7 cm. longi.

Slender vine, the stems striate, short villous with antrorse hairs; leaves opposite, short villous with curved hairs on petioles and both surfaces of leaf blade, the hairs sparse above at maturity, the petioles slender, 1.2–2.5 cm. long; leaf blades thin, chartaceous, ovate or oblong-elliptic, 7.5–14 cm. long, 2.5–6.5 cm. wide, apex subabruptly caudate-acuminate, base rounded and usually subcordate, evidently eglandular along costa and at base above, the midvein and primary nerves elevated beneath, impressed above, the primary lateral veins slender, arcuately ascending, 5- or 6-pairs, sometimes 5-nerved at base; racemes up to 7 cm. long, densely short villous, the hairs subappressed, rachis simple or 2- or 3-branched above, densely flowered and corymbose-racemose at apex; bracts caducous, foliaceous, linear-oblanceolate, up to 1.1 cm. long, 1.8 mm. wide above

middle; pedicels slender, 6–12 mm. long, accrescent; calyx lobes very thin, linear-oblanceolate like the bracts, up to 8 mm. long, hirtellous with subappressed hairs; disk thin, annular, minutely 5-dentate, the teeth opposite the sepals; corolla minutely strigillose, glabrous within, the tube spirally contorted below insertion of stamens, about 1.2 cm. long, urceolate below, constricted at middle, the throat subequalling tube in length, cylindrical, scarcely constricted at orifice, the lobes very thin, obliquely oblanceolate, about 7 mm. long, widest apically; stamens included, borne in throat, the filaments slender, 1 mm. long, sparsely villous; anthers glabrous, slightly exserted, 4 mm. long, widely auriculate at base, the auricles acicular, 1–1.2 mm. long, the anthers tapering from base to acuminate apex; nectaries 5, about half as long as the glabrous ovary; immature follicles slender, inconspicuously moniliform, up to 27 cm. long, short villous; fruiting pedicel 1.7 cm. long.

British Honduras: Toledo District, in high ridge, on hilltop, Manga Camp, Edwards Road, beyond Columbia, April 12, 1948, *Percy H. Gentle 6505* (LL, type), vine, white flowers.

Although collected in the same general area as the type of *L. peninsularis* Woodson, an imperfectly known species, differences in the flower parts and size of bracts, as well as indument, appear to separate *L. Gentlei* as a distinct taxon. In *L. Gentlei* the anthers are glabrous and slightly exserted, while they are puberulent-papillate dorsally and included in *L. peninsularis*.

Mandevilla Contrerasii Lundell, sp. nov. – Suffruticosa, volubilis, pubescentia; folia petiolata, petiolo 4–7 mm. longo; lamina ovata vel lanceolata, ad 10 cm. longa, 5.5 cm. lata, apice acuminata, basi cordata, supra hirtella vel hispidula, subtus dense piloso-tomentosa, albida, nervis lateralibus 5- vel 9-jugis; inflorescentia racemosa, 5–12 cm. longa, hirtella, multiflora; bracteae 3–4 mm. longae; pedicelli ad 10 mm. longi; sepala anguste lanceolata, 4–5 mm. longa, acuminata, parce hirtella; corolla cylindrica, ca. 2 cm. longa, extus glabra; antherae lineari-lanceolatae, ca. 4 mm. longae; ovarium ca. 1.3 mm. longum, apice parce puberulum; nectariis 5, ovario aequantibus.

Suffruticose lianas; stems slender, terete, hirtellous; leaves opposite, short petiolate, the petioles 4–7 mm. long, densely pilose; leaf blades subchartaceous, hirtellous above, white pilose-tomentose below, subbullate above, glandular at base of midrib, ovate or lanceolate, 5–10 cm. long, 2.5–5.5 cm. wide, apex acuminate, base cordate with narrow sinus; nodal appendages small, slender, tuberculate; inflorescence racemose, slender, 5–12 cm. long, hirtellous, bearing mostly numerous (often 30 or more) secund yellow-green flowers; pedicels slender, up to 10 mm. long, rather sparsely puberulent; bracts linear-lanceolate, 3–4 mm. long, apex acicular, puberulent; calyx lobes narrowly lanceolate, 4–5 mm. long, long acuminate, rather sparsely hirtellous or puberulent; squamellae small, unequal, several opposite each sepal, irregularly distributed; corolla salverform, glabrous without, the tube straight, about 1.5 cm. long, the lobes spreading, broadly obovate with subtruncate apex, about 5 mm. long, 6–8 mm. wide apically; stamens inserted about midway within the corolla tube,

the anthers linear-lanceolate, about 4 mm. long, with rounded small auricles, the tube villous within below anthers, otherwise glabrous; ovary oblong, about 1.3 mm. long, sparsely puberulent at apex; style slender; nectarics 5, thick, oblongoid, equalling the ovary.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, SW of the village, June 16, 1975, *C. L. Lundell & Elias Contreras 19461* (LL, type), vine, flowers yellow-green.

M. Contrerasii is near *M. scorpioidea* Woodson, differing in its shorter bracts and calyx lobes, attenuate floral buds, shorter pedicels, and yellow-green corolla. Woodson noted the differences in the plants from Chiapas and Guatemala in his monograph, and surmised that they might represent distinct species.

RUBIACEAE

Sickingia lancifolia Lundell, Wrightia 4. 50. 1968.

Guatemala: Dept. Peten, Cadenas, in clearing in *zapotal,* bordering Rio Gracias a Dios, Sept. 7, 1975, *C. L. Lundell & Elias Contreras 19810* (LL), tree, 45 ft. high, 5 in. diam., flowers white, fragrant, "*saltemuch*", "*chacahuante*"; La Cumbre, in *zapotal* on top of hill, 4 km. east on Rio Purula Road, Sept. 20, 1975, *Lundell & Contreras 19890* (LL), tree, 80 ft. high, 20 in. diam., flowers greenish, fragrant; also, *Lundell & Contreras 19909* (LL), from same locality.

This glabrous species is quite distinctive. The lanceolate leaves, never cordate at base, very shallow rounded calyx lobes entirely glabrous like the hypanthium and inflorescence, and the slender anthers usually 3 mm. or more in length are striking features.

Sickingia multiflora Lundell, sp. nov. — Arbor; ramuli dense hirtelli; folia parva, petiolata, lamina chartacea, lanceolata vel ovato-lanceolata, ad 15 cm. longa, 7 cm. lata, apice subabrupte acuminata, basi rotundata et cordata, supra glabrata, subtus parce hirtella vel hirsuta; inflorescentia terminalis, paniculata, hirtella, dense multiflora; flores sessiles vel subsessiles; hypanthium anguste obconicum, dense hirtellum; sepala 5, late ovata, 1.2–1.8 mm. longa, puberula, ciliolata; corolla campanulata, extus minute albo-tomentella, ca. 7 mm. longa, lobis 5; filamenta basi pilosa, ca. 6 mm. longa; antherae oblongae, ad 2.5 mm. longae, apice emarginatae.

Large tree, the branchlets rather short, densely hirtellous at first; leaves comparatively small, petiolate, the petioles slender, 1–2.5 cm. long, hirtellous; leaf blades thin, chartaceous, lanceolate or ovate-lanceolate, widest at middle, up to 15 cm. long, 7 cm. wide, apex subabruptly acuminate, the acumen acute or obtusish, narrowly cordate at base, the basal lobes rounded, the upper surface glabrate, the lower surface barbate in the axils of the primary nerves and the veins, persistently but rather sparsely subappressed hirtellous or hirsute along the costa and veins, the costa elevated beneath, the primary lateral veins slender, 13–16-pairs; inflorescences terminal, paniculate, densely hirtellous, rather compactly multiflowered, up to 10 cm. long; flowers with short pedicels or sessile; hypanthium narrowly obconic, densely and minutely hirtellous; calyx

with 5 broadly ovate sepals, the sepals 1.2–1.8 mm. long, usually rounded at apex, puberulent and ciliolate; corolla campanulate, minutely white-tomentellous, densely so below, pilose within tube below, about 7 mm. long, the 5 lobes rather thick, reflexed; stamens exserted, the filaments attached about 1 mm. above base of corolla tube, pilose below, about 6 mm. long; anthers oblong, up to 2.5 mm. long, emerginate at apex and base.

Guatemala: Dept. Peten, Tikal, on Temple IV, July 11, 1960, *Elias Contreras 1239* (LL, type), tree, 18 in. diam, 90 ft. high, "*chacahuante*"; Tikal, in *ramonal* covering the ruins, July 29, 1959, *Contreras 38* (LL), tree, 60 ft. high, 8 in. diam., flowers white.

The hirtellous indument and white tomentellous corolla are among the distinguishing features of the taxon.

BV 1012463 - ON TROPICOS: name + type

F104

A NEW SPECIES OF PRICKLY POPPY FROM MEXICO

MARSHALL C. JOHNSTON[1]

Argemone Ownbeyana M. C. Johnst., sp. nov. – A *Argemone fruticosa* et *A. Turnerae* caulis foliisque conferte inaequabileque aculeatis, sepalis aculeatis, capsulis aculeatis, ad maturitatem aculeis longioribus compositis partibus inferioribus aculeatis differt.

Mexico: Chihuahua, 31 km. west of Ojinaga on the Chihuahua highway, 5.5 km. southwest of Valverde, 850 m., 29°33′30″ N., 104°39′ W., in marly slightly gypseous alluvium, flowers white with yellow center, June 11, 1973, *M. C. Johnston, T. L. Wendt and F. Chiang C. 11271* (LL, type; isotypes MEXU and others to be distributed); 28.5 km. west of Ojinaga on the Chihuahua highway, 29°33′30″ N., 104°39′30″ W., 875 m., low marly hills, Oct. 20, 1972, *F. Chiang, T. L. Wendt and M. C. Johnston 9728* (LL, MEXU); 9.5 km. south of Ojinaga on La Perla highway, 29°28′ N., 104°25′ W., 775 m., upper Cretaceous gypseous marl flats, May 2, 1973, *M. C. Johnston, T. L. Wendt and F. Chiang C. 10732* (with H. S. Gentry and R. G. Engard) (LL, MEXU, etc.); 10 mi. south of Ojinaga on road to Alamo Chapo, low hills of somewhat saline clay, "shrubby," Aug. 8, 1940, *I. M. Johnston & C. H. Muller 15* (GH, LL).

The specific name is intended to honor Professor Gerald Bruce Ownbey (born 1916) of the University of Minnesota, for whose splendid taxonomic groundwork on these beautiful but noxious plants (Ownbey, 1958) we must be profoundly grateful.

Morphologically, *A. Ownbeyana* is clearly similar to *A. fruticosa* A. Gray of southern Coahuila and to *A. Turnerae* A. M. Powell of east-central Chihuahua. These three taxa share a shrubby habit, tough, unlobed, glaucous leaves, large yellow-centered flowers, and shortly

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conic-ovoid capsules, and they stand clearly apart from the rest of the genus in these characters. They are all desert gypsophiles. They are morphologically distinguished, inter se, on the basis of their armature, a character that normally would be sufficient, along with geographic segregation, to permit the recognition of subspecies or varieties at most. However, I am led to the present conservative treatment by the strong geographic disjunction of all three and the discovery that *A. fruticosa* and *A. Turnerae* are quite distinct in their alkaloid-content (Stermitz, et al., 1973, both papers). The alkaloids of *A. Ownbeyana* have not been investigated as yet.

This paper represents work toward a *Chihuahuan Desert Flora* supported in part by National Science Foundation grant BMS-73-00898-A01. I am indebted to B. L. Turner for data on *A. Turnerae* and for pointing out the existence of information on alkaloids in chicalotes.

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VOLUME 5 DECEMBER, 1976 NUMBER 8

WRIGHTIA

A BOTANICAL JOURNAL

CONTENTS

PUBLISHED BY
THE UNIVERSITY OF TEXAS AT DALLAS
RICHARDSON, TEXAS

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. The contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume will contain a series of numbers. The numbers will be issued at irregular intervals.

VOLUME 5, NUMBER 8
ISSUED DECEMBER 10, 1976

Printed in the U.S.A.
Etheridge Printing Company
Dallas, Texas

WRIGHTIA

VOLUME 5 DECEMBER, 1976 NUMBER 8

A TAXONOMIC STUDY OF ACLEISANTHES (NYCTAGINACEAE)

JACKIE MARIE SMITH[1]

Abstract

Acleisanthes A. Gray is a genus of seven species occurring in the southwestern United States and northern Mexico. Several of the species are widespread and variable, while other species are known only from a few localities. The key characters between the species are based on the flower and fruit morphology. An earlier description of the pollen of *Acleisanthes* is amended, based on examination of herbarium specimens.

Acleisanthes, a small genus of seven species, occurs in a wide range of habitats, from the humid coasts of Texas and northern Mexico to the arid Chihuahuan and Sonoran deserts, from nearly sea level along the Texas coast to about 2500 meters in the mountains of Mexico, and in soils derived from calcareous, gypseous, igneous-rock, or sandy substrates. A low-growing, perennial herb with simple, opposite leaves and fragrant, white, tubular flowers, *Acleisanthes*, when in full flower, is quite striking. However, small, barely noticeable cleistogamous flowers are also produced, making an entirely cleistogamous plant inconspicuous.

Choisy (1849) wrote the first description of a species of *Acleisanthes*; however he placed it in the genus *Nyctaginea* Choisy (*N. obtusa* Choisy). Asa Gray (1853) in describing new genera of the Nyctaginaceae collected by Charles Wright in Texas and New Mexico, proposed the genus *Acleisanthes* (so called for lack of an involucre) to accommodate several new species. One of these, *A. Berlandieri* A. Gray, he considered conspecific with *N. obtusa*. In this same article, he also described a monotypic, new genus, *Pentacrophys* A. Gray. However, this was placed in synonymy with *Acleisanthes* by Bentham and Hooker (Hemsley, 1882). Standley (1909) proposed two new species and a new subspecies. The most recently proposed taxon was described by I. M. Johnston (1944). Although Gray did not designate a type species for *Acleisanthes*, Standley (1918) designated *A. crassifolia* A. Gray as the type.

Acleisanthes is most closely related to *Selinocarpus* A. Gray. Both were described by Gray (1853), along with *Pentacrophys*, which was placed as intermediate between *Acleisanthes* and *Selinocarpus*. Although *Pentacrophys* has been relegated to synonymy, *Acleisanthes (Pentacrophys) Wrightii* A. Gray is still the closest link between *Acleisanthes* and *Selinocarpus*, being virtually indistinguishable vegetatively from the species, *S. diffusus* A. Gray. Nowicke's (1970) survey of Nyctaginaceae pollen shows the pollen of *Acleisanthes* to be most similar to that of *Selinocarpus*. Also both genera have similar involucral bracts, perianths, and prefer-

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ences for arid habitats. The main distinction between the two is the fruit. *Selinocarpus* invariably has a fruit with five, well-developed, thin, membranous wings, whereas that of *Acleisanthes* has five or ten ribs, but never wings.

Acknowledgements

I am grateful to the following institutions for the use of herbarium material: ARIZ, ASU, ENCB, F, GH, LL, MEXU, MICH, MO, NY, POM, RSA, SMU, SRSC, TAES, TEX, TTC, UC, UNM, US. A complete list of specimens on which the maps are based is available from the author and will be supplied on request. I also wish to thank Dr. B. L. Turner for encouraging my interest in systematic botany and assisting me during my study, Dr. Marshall Johnston for his aid in nomenclatural and bibliographical problems and financial support for collecting trips in Texas and Mexico, and Dr. C. L. Lundell for financial support during my last year in graduate school.

Pollen

In a survey of pollen of the Nyctaginaceae, Nowicke (1970) described the pollen of several species of *Acleisanthes*. After examination of the herbarium specimens cited in her article, the following corrections are in order: the name *A. Berlandieri* is synonymous with *A. obtusa* (Choisy) Standl., her cited *A. crassifolia* is *A. obtusa*, and her cited *Selinocarpus parvifolius* (Torr.) Standl. is *Acleisanthes longiflora* A. Gray.

Considering the above, an amended pollen description for *Acleisanthes* seems appropriate:

Acleisanthes: Grains spheroidal (105–143 μ in diameter), pantoporate (20–45 pores), the pores ovoid to ellipsoid, 8–12 μ in diameter, the pore plate with (1–) 2–5 spinules, the nexine 4.5–5.5 μ thick, the sexine 4–5.2 μ thick, tubuliferous and spinulose, the spinules 1–3.5 μ long.

A. longiflora: Grains 105–143 μ in diameter, 20- to 28-porate, pores slightly ellipsoid, 10–12 μ or 9 $\times$ 11 μ, nexine$\sim$ 5.2 μ thick, sexine $\sim$ 5.2 μ, spinules $\sim$ 1.8–3.5 μ long.

A. obtusa: Grains 107–120 μ in diameter, 27- to 45-porate, pores ovoid to ellipsoid, $\sim$ 8 $\times$ 10 μ in diameter or 5.2–12 μ in diameter, nexine $\sim$ 4.5–5.5 μ thick, sexine $\sim$ 4–4.7 μ thick, spinules $\sim$ 1 μ long.

Although spinule length can no longer be used as a generic criterion, aperture size, as pointed out by Nowicke, would be useful in generic delineation at the pollen level. In accordance with the amended pollen descriptions, *Acleisanthes* has pores 8–12 μ in diameter whereas *Selinocarpus* has pores 2.5–5.0 μ in diameter.

ACLEISANTHES A. Gray

Perennial, pubescent herbs with clambering stems from long, stout, woody taproots; stems slender to stout, sparsely- to much-branched; leaves simple, opposite, those of a pair subequal to greatly unequal, sessile to short-petioled, thick, crispate, undulate or flat, paler beneath;

flowers perfect, axillary, sessile or short-pedicelled, solitary or in several flowered cymes, each subtended by 1 to 3 narrow bracts, chasmogamous and/or cleistogamous; chasmogamous perianth white or creamy, often tinged with pink or green, elongate-funnelform or tubular-funnelform, the tube elongate or rarely short, constricted above the ovary, abruptly expanded into a 5-lobed limb, the lobes plicate; cleistogamous perianth much smaller, green, frequent; stamens 2–5, unequal, exserted, filaments filiform, united by dilated bases, adherent basally to the perianth tube; anther didymous, opening longitudinally; style filiform, stigma peltate, exserted beyond the stamens; fruit oblong, 5-angled, 5-ribbed or ridged, with 5 secondary ribs or these obselete, coriaceous, often constricted below the apex, with 5, sticky, resinous glands or glandless; seed brown, the testa adhering to the fruit; embryo conduplicate, the broad cotyledons enfolding the mealy endosperm, the radicle descending.

Type species, *A. crassifolia* A. Gray. 2250032

Key

1. Fruit with a resinous gland near or on the apex of the primary ribs of the fruit (2).
   2. Fruit with 10 ribs (5 broad, primary ribs with a resinous gland at the apex, and 5 narrow, secondary ribs delimited by 2 deep, parallel grooves between the primary ribs); perianth of the chasmogamous flowers 0.6–1.3 cm. long; stems 2–8 cm. long. ..... 3. *A nana* I. M. Johnst.
   2. Fruit with 5 broad ribs, the secondary ribs obsolete; perianth or chasmogamous flowers 2–5 cm. long; stems 10–40 cm. long (3).
      3. Glands at the apex of mature fruit, ribs not extending past glands; fruit oblong and truncate at both ends. ..... 2. *A. Wrightii* (A. Gray) Benth. & Hook.
      3. Glands below apex of mature fruit, fruit constricted at level of glands; fruit oval-oblong, truncate at apex but tapering at the base ..... 1. *A. acutifolia* Standl.

1. Fruit without resinous glands (4).
   4. Fruit 5-angled with 5, broad, flat ribs and shallowly 5-sulcate, hirtellous; leaf blades adaxially hirtellous on the primary and secondary veins ..... 4. *A. crassifolia* A. Gray
   4. Characters not as above (5).
      5. Fruit with 10 ribs; leaves of a pair very unequal ..... 5. *A. anisophylla* A. Gray
      5. Fruit with 5 ribs; leaves of a pair slightly unequal (6).
         6. Perianths usually in 2- to 5-flowered cymes, occasionally solitary, those of the chasmogamous flowers 2.5–5.5 cm. long ..... 6. *A. obtusa* (Choisy) Standl.
         6. Perianths usually solitary, rarely geminate, those of the chasmogamous flowers 7–17 cm. long ..... 7. *A. longiflora* A. Gray

1. Acleisanthes acutifolia Standl., Contr. U. S. Nat. Herb. 12:370. 1909. Texas: Brewster Co., Maxon's spring, (near Tesnus in northeastern Brewster Co.), 1880–1885, *V. Havard s. n.* (US, holotype).

Perennial, pubescent herb from thick, woody caudex, with long, slender, cylindrical taproot; pubescence a mixture of minute, capitate-glandular hairs (0.2–0.3 mm. long) and shorter (0.1–0.2 mm long), white, capitate hairs; stems stout, decumbent to ascending, much-branched, 1–4 dm. long, hirtellous to glabrate; leaves opposite, those of a pair subequal,

from half to twice as long as the internodes; petioles stout, puberulent to hirtellous, 1–15 mm. long, the uppermost leaves sessile or nearly so; blades oval to oblong-elliptic, acute to obtuse at the base, apiculate and acute to obtuse, or infrequently rounded at the apex, (5–) 10–50 mm. long, 3–20 (–25) mm. wide, thick, firm, crispate or undulate, paler beneath, puberulent or occasionally hirtellous on the leaf margins and the adaxial midvein; flowers solitary, sessile or nearly so, chasmogamous and/or cleistogamous; bracts 1 to 3, 3–10 mm. long, (bracts of the chasmogamous perianths generally longer than those of the cleistogamous perianths), linear to subulate, hirtellous to puberulent, from half to as long to slightly longer than the fruit; chasmogamous perianth elongate-funnelform, white or cream-colored, often with yellowish or pinkish veins, fragrant, 2–5 cm. long, the slender tube 1.0–1.5 mm. in diameter, the 5-lobed, somewhat star-shaped limb 1–3 cm. broad, puberulent, with 5 stamens, stamens and style shortly exserted; cleistogamous perianth green, 4–10 mm. long, hirtellous, with 2, or very rarely 3–5, stamens; fruit oval-oblong, 5–8 mm. long, tapering at the base, truncate at the apex, constricted 0.5–1.0 mm. beneath the apex, sparsely puberulent on those developed from chasmogamous perianths, glabrous on those developed from cleistogamous perianths, with 5, narrow sulci and 5, broad, smooth ribs, each bearing a sticky, resinous gland in the constriction below the apex.

Distribution (fig. 36): In calcareous or gypseous soils in the Chihuahuan desert region, trans-Pecos Texas and adjacent Mexico south to Zacatecas. At altitudes of 750–2500 m. Occurring with *Larrea tridentata* (DC.) Cov., *Agave lecheguilla* Torr., *Viguiera stenoloba* Blake, *Fouquiera splendens* Engelm., *Dasylirion* Zucc., and *Yucca* L.

Acleisanthes acutifolia is readily distinguished from the other species in the genus by the constricted, oval-oblong fruit with glands in the depressions of the ribs, and the unusual pubescence. The most closely related species is *A. Wrightii,* with which it is often confused, the two being quite similar superficially. Characters often used in past keys to distinguish the two, are either similar in both species (the length of the bracts and the number of stamens) or too variable within the species to be consistent key characters (e. g., apical shape of the blade).

Texas: Brewster Co., Peña Colorada, 1880, *V. Havard s. n.* (GH); Pecos Co., Leon Springs, west of Fort Stockton, *Bigelow 1127* (GH, NY, US); Presidio Co., 3 mi. southwest of Shafter, July 30, 1945, *C. H. Muller 8472* (ARIZ, LL, MICH, SMU).

Mexico: Chihuahua, ca. 9 mi. southwest of Coyame, Oct. 21, 1974, *J. Smith et al. 358 a & b* (LL); Santa Eulalia Mountains, Aug. 25, 1885, *C. G. Pringle 671* (F, GH, MICH, MO, NY, RSA, US); 14 km. south of Valle de Zaragoza, June 21, 1973, *M. C. Johnston et al. 11425* (LL). Coahuila, Saltillo, Sept. 1898, *Dr. Edward Palmer 282* (GH, MO, NY, US); Sierra del Pino, southern canyon, Aug. 26, 1940, *I. M. Johnston & C. H. Muller 728* (GH); 1 km. northeast of Rancho Parritas, eastern margin of Valle de Acatita, Sept. 27, 1942, *R. M. Stewart 2765* (GH).

Durango, 31 mi. south of La Zarca, Aug. 10, 1961. Zacatecas, south of Cardona, road from Cardona southwest to Sierra Hermosa, Sept. 3–4, 1938, *I. M. Johnston 7376* (GH).

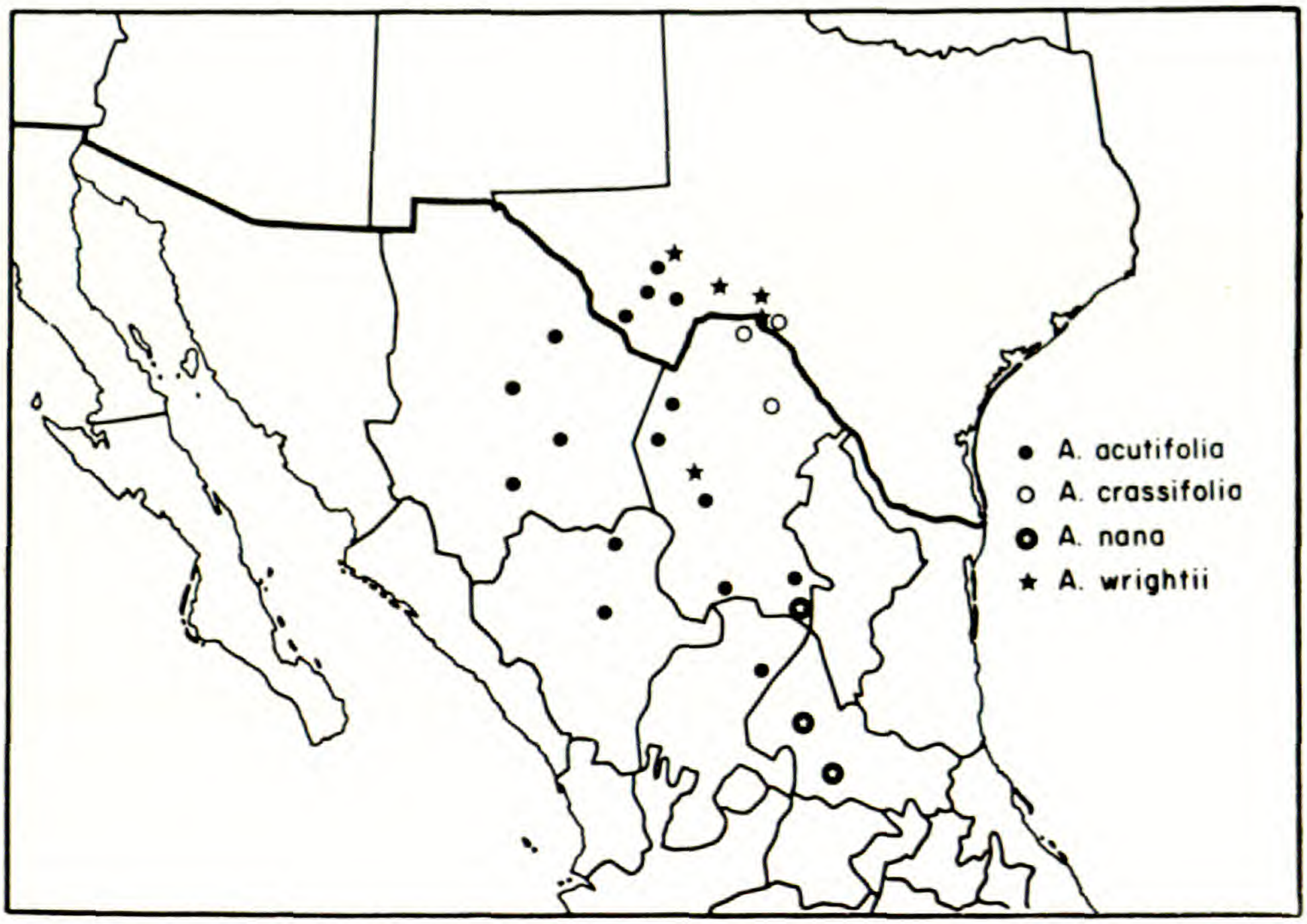

Fig. 36. Distribution of Acleisanthes.

2. Acleisanthes Wrightii (A. Gray) Benth. & Hook., Hemsl. Biol. Centr. Am. 3:6. 1882. *Pentacrophys Wrightii* A. Gray, Amer. J. Sci. Ser. 2. 15:261. 1853. Texas: Val Verde Co., stony prairies at camp in big bend of the San Pedro River (probably at what is now the Devil's River), May 21, 1851, *C. Wright 168 (1713 exs.)*, (GH, holotype).

Perennial, pubescent herbs from a thick, woody caudex and deep, cylindrical taproot; pubescence a mixture of minute, capitate-glandular hairs (0.2–0.3 mm. long) and shorter (0.1–0.2 mm. long), white, capitate hairs; stems stout, erect or ascending or decumbent, 1–4 dm. long, much-branched from the base, puberulent to glabrate; leaves opposite, those of a pair subequal, from about half to as long as the internodes; petioles stout, puberulent, 1–15 mm. long, about half the length of the blades; blades oval to ovate-lanceolate or suborbicular, 5–35 mm. long, 3–20 mm. wide, slightly unequal and obtuse to rounded or acute at the base, apiculate and obtuse or infrequently acute at the apex, thick, firm, crispate, paler beneath, hirtellous to puberulent; flowers solitary, sessile or with pedicels to 1 mm. long, chasmogamous and/or cleistogamous; bracts 1 to 3, 2–8 mm. long, (those of the chasmogamous perianths longer than those of the cleistogamous perianths), linear-subulate, hirtellous to puberulent, mostly three-quarters as long as the fruit or shorter; chasmogamous perianth elongate-funnelform, white, fragrant, 2.5–5.0 cm. long,

the slender tube 1.0–1.5 mm. in diameter, the 5-lobed limb, 10–15 mm. broad, puberulent to hirtellous, with 5 stamens, stamens and style slightly exserted; cleistogamous perianth green, 3–8 mm. long, hirtellous, with 2, rarely 3–5, stamens; fruit oblong, truncate at both ends, 5–9 mm. long (chasmogamous perianth fruit longer than that of cleistogamous perianth), puberulent, strongly 5-ribbed and deeply 5-sulcate, the 5 broad, smooth ribs each terminating above in a hemispherical tubercle with apical glands.

Distribution (fig. 36): In limestone rocklands, usually on plains and prairies, in trans-Pecos Texas from Val Verde County northwestward to Reeves County. At altitudes of 250–1000 m. Occurring with *Larrea tridentata*, *Agave lecheguilla*, and *Viguiera stenoloba*.

Acleisanthes Wrightii is easily separated from the other species by the oblong fruit with apical glands. For discussion of relationships, refer to the treatment of *A. acutifolia*.

Gray combined Wright's field numbers *117*, *168*, and *379* into *Wright 1713*, the type collection for this species, with the general locality, "stony prairies at the Big Bend of the San Pedro River, and between the Pecos and the Limpio, on route between Texas and El Paso, May, June", 1851. Wright's original field notes as transcribed by I. M. Johnston (1940), list his number *117* as a borage from the "stony prairies on Zoquete Creek, western Kinney County, Texas". Both *168* and *379* are listed as Nyctaginaceae, presumably *Acleistanthes Wrightii*. Number *168* is from the Devil's River area in Val Verde County, Texas, and *379* is from the "stony hills at Comanche Springs, June 7, 1851" which is located in Fort Stockton, Pecos County, Texas.

Texas: Brewster Co., 3.5 mi. north of Marathon, July 21, 1967, *B. H. Warnock 22592* (SRSC); Pecos Co., 3 mi. west of Fort Stockton, May 22, 1974, *J. Smith & M. Butterwick 102* (LL); Reeves Co., ca. 20 mi. east of Balmorhea, Sept. 28, 1948, *V. L. Cory 40521* (TAES, TEX); Terrell Co., 15 mi. west of the cutoff to Pumpville, Sept. 2, 1974, *M. Butterwick & B. L. Turner 513* (LL); Val Verde Co., 2 mi. southeast of Del Rio, July 8, 1958, *D. S. Correll & I. M. Johnston 19433* (LL).

3. **Acleisanthes nana** I. M. Johnston, J. Arn. Arb. 25: 167. 1944. Mexico: San Luis Potosi, Los Charcos, May 15, 1891, *C. G. Pringle 5081* (GH, holotype).

Small, perennial, pubescent herb from woody caudex and deep, cylindrical taproot; pubescence of minute (0.2–0.3 mm. long), white, propellor-shaped, capitate hairs; stems slender, decumbent or ascending, 2–8 cm. long, sparsely branched, densely hirtellous to puberulent to glabrate; leaves opposite, those of a pair somewhat unequal, often about twice the length of the internodes; petioles 1–8(–12) mm. long, mostly less than half the length of the blades, puberulent, blades thick, slightly crispate, lanceolate to elliptic or suborbicular, 5–30 mm. long, 2–15 mm. wide, acute, or less frequently obtuse, at the apex, obtuse or acute at the base, hirtellous to puberulent; flowers sessile or nearly so, solitary, chasmogamous and/or cleistogamous; bracts 1 to 3, 1–3 mm. long (those of the chasmogamous perianths longer than those of the cleistogamous perianths), linear to subulate, hirtellous, from half to as long as the fruit; chasmogamous perianth funnelform, "rose"-colored, 6–13 mm.

long, the slender tube 0.5 mm. in diameter, the 5-lobed limb 5–12 mm. broad, puberulent to hirtellous, with 5 stamens, stamens and style shortly exserted; cleistogamous perianths green, 1–4 mm. long, hirtellous, with 2 stamens; fruit oblong-prismatic, truncate at both ends, 5–6 mm. long, 1.0–1.5 mm. thick, puberulent, 10-ribbed: 5 broad, primary ribs, each bearing a hemispherical gland at the summit, and between the 5 broad, primary ribs, 5 secondary ribs delimited by 2 deep parallel grooves which widen at both ends.

Distribution (fig. 36): In playa valleys, stony flats, and alluvial terraces, presumably on gypsum soil, south of Carneros and the vicinity of Fraile in Coahuila and from three localities in San Luis Potosi. At altitudes of 1500–2000 m. Occurring with *Larrea tridentata, Acacia* Mill., and herbaceous weeds. Rare.

This species, closely related to *Acleisanthes acutifolia* and *A. Wrightii*, is easily distinguished from the other members of the genus by the small size of the leaves, bracts, flowers, and fruits, and the unusual pubescence. The 10-ribbed fruit, as described previously, is quite distinctive; the 5 broad ribs do not cover the 5 lateral ribs, as in *A. acutifolia* and *A. Wrightii*.

I. M. Johnston (1944) suspected *A. nana* of being gypsophilous.

Mexico: Coahuila, Fraile, 59 km. south of Saltillo, July 10, 1941, *L. R. Stanford et al. 291* (GH, MO); stony flats of Carneros on road toward Concepion, Aug. 20, 1968, *H. D. Ripley 14931* (NY). San Luis Potosi, 5 km. northeast of Laguna de Seca, km. 20, road from San Luis Potosi to Antiguo Morelos, Aug. 30, 1955, *Rzedowski 6318* (ENCB, MICH); km. 20, road from San Luis Potosi to Rioverde, July 29, 1955, *Rzedowski 6161* (ENCB).

4. Acleisanthes crassifolia A. Gray, Amer. J. Sci. Ser. 2. 15:260. 1853. Texas: Val Verde Co., high prairies of San Felipe Creek (probably near Del Rio), July 17, 1849, *C. Wright 682 (599a exs.)*, (GH, holotype; NY, US, isotypes).

Perennial, pubescent herbs from a deep, thick taproot, pubescence of minute (0.1–0.2 mm. long), white, capitate hairs; stems stout, procumbent, 15–50 cm. long, sparsely-branched, hirtellous to glabrate; leaves opposite, those of a pair unequal, from one-third to almost as long as the internodes; petioles stout, hirtellous, 2–15(–20) mm. long, from one-third to two-thirds as long as the blades; blades ovate to deltoid-ovate or oblong-ovate, (5–)10–35(–45) mm. long, 2–20(–30) mm. wide, usually rounded at the base, apiculate and acute or less frequently obtuse at the apex, thick, succulent, undulate, paler beneath, abaxilly sparsely puberulent, adaxially the same but hirtellous on the primary and secondary veins; flowers solitary, sessile or nearly so, erect, chasmogamous and/or cleistogamous; bracts 1 to 3, 2–7 mm. long (bracts subtending chasmogamous perianths longer than those subtending cleistogamous perianths), linear-lanceolate, long-attenuate, usually puberulent, from one-third to one-half as long as the fruit; chasmogamous perianth elongate-funnelform, white, often with a pink tube, fragrant, 3–5 cm. long, the slender tube 1.0–1.5 mm. in diameter, the 5-lobed, somewhat star-shaped, limb 8–25

mm. broad, puberulent, with 5 stamens, stamens and style slightly exserted; cleistogamous perianth green, 2–6 mm. long, hirtellous, with 2 stamens; fruit oval-oblong, truncate at both ends, 6–9 mm. long, 3–4 mm. in diameter, hirtellous, 5-angled, shallowly 5-sulcate, the 5 ribs broad and flat.

Distribution (fig. 36): On limestone rocklands and calcareous soils in Val Verde County southeast of Del Rio and in a few localities in northeastern Coahuila. At altitudes of 250–650 m. Occurring with *Prosopis glandulosa* Torr., *Acacia Berlandieri* Benth., *A. rigidula* Benth., *Leucophyllum frutescens* (Berl.) I. M. Johnst., and *Agave lecheguilla*. Rare.

Acleisanthes crassifolia is readily distinguished from the other species by the adaxial pubescence on the primary and secondary veins of the leaves, the densely pubescent fruit, and the unusual pubescence.

Heimerl (1934) divided *Acleisanthes* into two sections: *Acleisanthes* including *A. longiflora, A. anisophylla, A. obtusa,* and *A. crassifolia* and *Pentacrophys* containing *A. Wrightii* and *A. acutifolia*. The major distinction between the two groups is the presence or absence of sticky, resinous glands on the fruit. *A. crassifolia,* like the other members of section *Acleisanthes,* lacks sticky, resinous glands on the fruit. Aside from this character, *A. crassifolia* has no other feature in common with the other species of this section. *A. crassifolia* is similar to *A. Wrightii* and *A. acutifolia* in that the cleistogamous flowers have two stamens and the chasmogamous floral tubes expand into a five-lobed, somewhat star-shaped limb. Thus *A. crassifolia,* with a glandless fruit, two stamens per cleistogamous flower, and distinctly five-lobed, somewhat star-shaped limb, is intermediate between the two sections although its characters correspond more closely to *A. Wrightii* and *A. acutifolia*.

Fortunately Wright's original field number, *682,* written on a small slip of paper, is contained in the fragment folder on the holotype. Thus there is a direct correspondence between the exiccata number and Wright's original field number. In Gray's article of 1853, the exsiccata number is given as *599*, the same number as for *Acleisanthes longiflora.* However all the type specimens have *599a* as an exsiccata number. Probably the "a" deletion was a printing error.

Texas: Val Verde Co., 23 mi. southeast of Del Rio, May 19, 1974, *J. Smith and M. Butterwick 73* (LL).

Mexico: Coahuila, 14 mi. north of Nueva Rosita, Oct. 27, 1974, *J. Smith et al. 439 & 440* (LL); 18 km. west of Ciudad Acuña, June 1, 1972, *M. C. Johnston et al. 7501c* (LL).

5. Acleisanthes anisophylla A. Gray, Amer. J. Sci. 2. 15:261. 1853. Texas: High, rocky, limestone prairie, Turkey Creek to Elm Creek (probably near the Uvalde-Kinney Co. line), May 16, 1851, *C. Wright 78 (1706 exs.)*, (GH, holotype; MO, NY, US, isotypes).

Perennial, pubescent herbs from thick, woody, tuberous taproots; pubescence of minute (0.1–0.2 mm. long), white, capitate hairs; stems slender to stout, decumbent, much-branched at the base, 3–15 cm. long, puberulent to glabrate; leaves opposite, those of a pair very unequal, one twice to ten times as long as the other, sessile or more often petioled;

petioles stout to slender, puberulent to glabrate, those of the smaller leaves to 12 mm. long, mostly less than one-third the length of the blades, those of the larger leaves 2–35 mm. long, mostly less than one-half the length of the blades; blades ovate to oval-oblong or oval-rhombic, acute to rounded or obtuse and apiculate at the apex, rounded to obtuse at the base, unequal and short-decurrent, thick, succulent, flat or very slightly undulate, puberulent to glabrate, the smaller blades 3–28 mm. long, 2–15 mm. wide, the larger blades 6–70 mm. long, 3–35 mm. wide; flowers solitary, sessile or with a short, puberulent pedicel to 1 mm. long, chasmogamous and/or cleistogamous; bracts 1 to 3, 2–6 mm. long (bracts subtending the chasmogamous perianths longer than those subtending the cleistogamous perianths), linear-lanceolate to linear-subulate, sparsely puberulent, less than one-third to slightly exceeding the fruit; chasmogamous perianth elongate-funnelform, white with pinkish tube, 4–6 cm. long, the 5-lobed limb 2–4 cm. wide, the slender tube 1 mm. in diameter, puberulent, with 5 stamens, stamens and style shortly exserted; cleistogamous perianth green, 1–3 mm. long, puberulent, with 5 stamens; fruit oval-oblong, truncate at both ends, slightly constricted above the base, 3–6 mm. long, 2 mm. in diameter, sparsely puberulent, with 10 equal ribs.

Distribution (fig. 37): On limestone rocklands, shale hills, and sandy soils at scattered localities in south Texas and northeastern Mexico. At altitudes of 40–350 m. Occurring with *Prosopis glandulosa* and *Acacia Berlandieri.* Rare.

Acleisanthes anisophylla is easily distinguished from the other species by the pair of very unequal leaves and the fruit with ten equal ribs. *A. anisophylla* is most closely related to *A. longiflora* and *A. obtusa.* All have fruit lacking sticky, resinous glands, and cleistogamous flowers with five stamens.

In Gray's original description of this species, two exsiccata numbers, *Wright 598* and *1706,* were listed. Standley (1909) selected *exs. 1706* as the type. Wright's original field number, *78,* corresponds directly to *exs. 1706.*

Texas: Karnes Co., 2.5 mi. west of Kenedy, on Lenz road, Oct. 21, 1952, *J. C. Johnson 1072* (SMU); Kinney Co., 15 mi. east of Bracketville, Apr. 20, 1974, *J. Smith et al. 13* (LL); San Patricio Co., near Lake Corpus Christi, ca. 5 mi. west of Mathis, Oct. 1, 1955, *F. B. Jones 1171* (SMU, TEX); Starr Co., Riogrande, July 1, 1927, *R. Runyon 141* (US); Uvalde Co., high prairies at foot of hills near Turkey Creek, June 28, 1849, *C. Wright 598* (GH); Val Verde Co., Devil's River, May 14, 1918, *E. J. Palmer 13611* (MO).

Mexico: Coahuila, ca. 25 mi. north of Nueva Rosita, Uriste Ranch, May 30, 1963, *Mrs. Latorre 10* (TEX). Nuevo Leon, Tamaulipas state line on the Victoria-Linares highway, Sept. 29, 1960, *M. C. Johnston 5830* (MICH, TEX); 6 mi. south of Sabinas Hidalgo on the Monterrey highway, Nov. 10, 1959, *M. C. Johnston & J. Graham 4611A* (TEX). Tamaulipas, 5 mi. east of Casas on the Victoria-Soto la Marina highway, Sept. 28, 1960, *M. C. Johnston & J. Crutchfield 5783C* (TEX); 5 mi. west of Morales, 19 mi. east of San Fernando-Santander Jimenez highway on

the Loreto road, Sept. 16, 1960, *M. C. Johnston & J. Crutchfield 5588* (TEX).

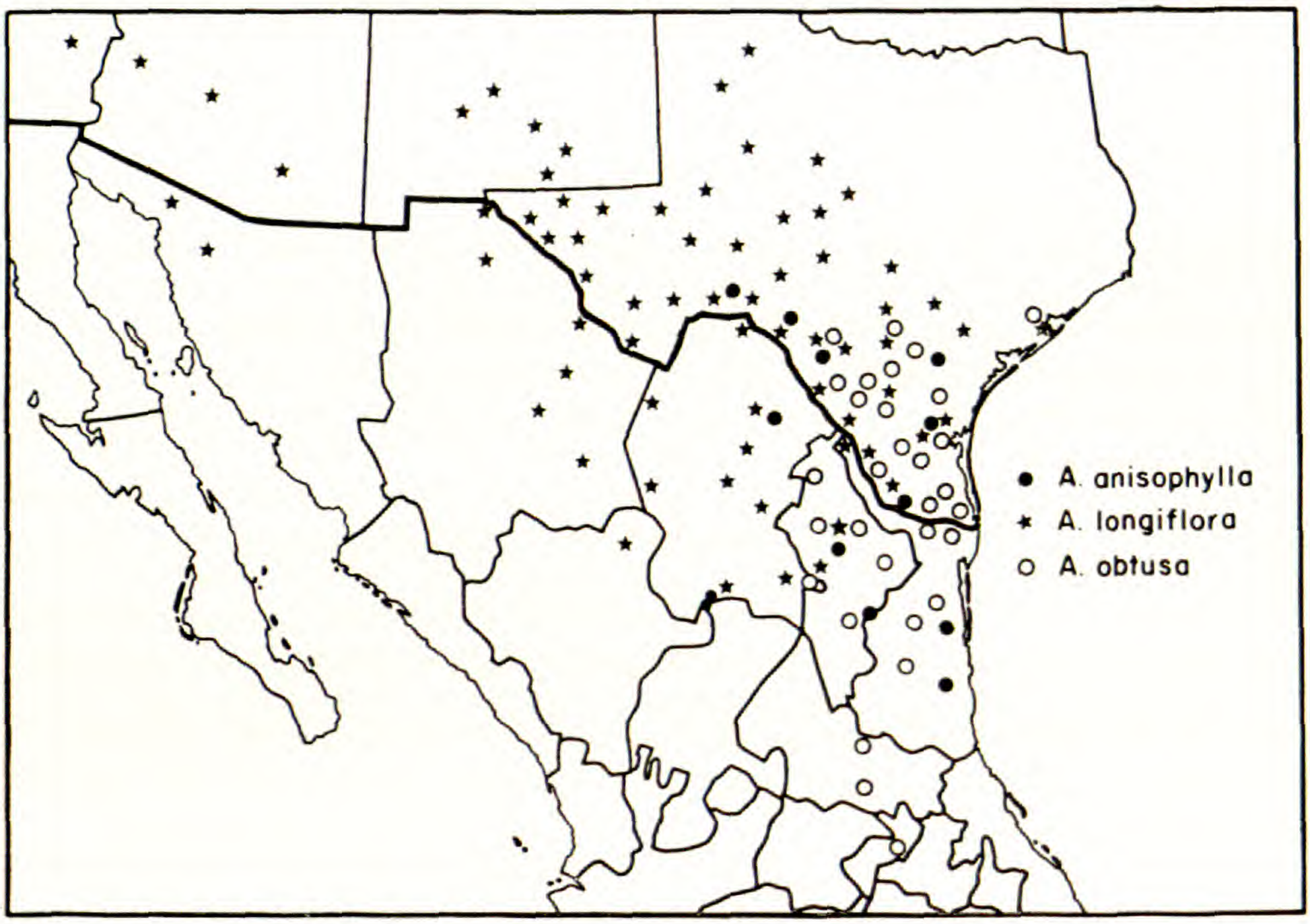

Fig. 37. Distribution of Acleisanthes.

6. Acleisanthes obtusa (Choisy) Standl., Contr. U. S. Nat. Herb. 12:371. 1909. *Nyctaginea obtusa* Choisy, DC. Prodr., 13 (2):429. 1849. Texas: Between the Rio Frio and the Nueces River, *Berlandier 2007*, (IDC 800. 2213: II. 4, 5[2], holotype; MO, isotype). *Acleisanthes Berlandieri* A. Gray, Amer. J. Sci. Ser. 2. 15:260. 1853. Typified by the above. *A. Greggii* Standl., Contr. U. S. Nat. Herb 12:371. 1909. Mexico: Nuevo Leon, Monterrey, June 22, 1848, *Gregg 157*, (MO, holotype; GH, isotype).

Perennial, pubescent herbs with clambering stems from stout, woody taproots; pubescence of minute (0.1–0.2 mm. long), white, capitate hairs; stems slender to stout, prostrate or spreading, much-branched, to over 1 m. long, hirtellous to glabrate; leaves opposite, those of a pair slightly unequal, from one-half to as long as the internodes, sessile or petioled; petioles to 25 mm. long, hirtellous to glabrate, to three-quarters the length of the blades; blades deltoid to deltoid-ovate, acute to broadly rounded and often apiculate at the apex, truncate to subcordate or rounded and short-decurrent at the base, thin to thick and succulent, flat or slightly undulate, puberulent to glabrate, 2–30 (–45) mm. long, 2–35(–50) mm. wide; flowers sessile or with a short, sparsely puberulent pedicel to 5 mm. long, solitary or in 2- to 5-flowered cymes, chasmogamous and/or cleistogamous; bracts linear-subulate, puberulent, usually sparsely

[2]Hepper, F. N. 1968. A standard citation of microfiches. Taxon 17:604.

so, 1–7 mm. long, from one-half to equalling the fruit; chasmogamous perianth elongate-funnelform, white, often with a pinkish tinge, fragrant, 25–55 mm. long, the shallowly 5-lobed limb 13–25 mm. broad, the slender tube 1–2 mm. in diameter, sparsely puberulent, with 5 stamens, stamens and style exserted; cleistogamous perianth green, 3–12 mm. long, puberulent, with 5 stamens; fruit oblong, truncate at both ends, often constricted about 1 mm. above the base and below the apex, 5–8 mm. long, hirtellous to sparsely puberulent with the aforementioned capitate hairs and with a few, scattered, minute (0.2–0.3 mm. long), "beaded" hairs, 5-ribbed with a pair of parallel grooves between each rib, each rib and pair of grooves ending at the summit in a very small, inconspicuous, glandless knob.

Distribution (fig. 37): Predominantly on sandy, silty, or clay soils, occasionally on soils derived from calcareous or igneous-rock substrates, in south Texas and northeastern Mexico to Queretaro. At altitudes of 5–1800 m. Occurring with *Prosopis glandulosa*, *Ziziphus obtusifolia* (T. & G.) A. Gray, *Celtis pallida* Torr., *Karwinskia Humboldtiana* (R. & S.) Zucc., *Acacia* spp., and various cacti.

Acleisanthes obtusa is readily recognized by its several-flowered cymes, the length of its chasmogamous perianths, and its oblong, 5-ribbed fruit. *A. obtusa* is most closely allied to *A. longiflora*. Both have fruits with five ribs or ridges with a pair of parallel grooves between the ribs or ridges and both lack resinous glands. *A. obtusa* and *A. longiflora* are the only species of the genus with the "beaded" hair type of pubescence. The cleistogamous flowers of both species have five stamens per flower, and the chasmogamous flowers of both have thin tubes that abruptly expand into a five-angled or, at most, a very shallowly five-lobed limb.

In a comparison of the descriptions of *A. obtusa* and *A. Greggii* from Standley's (1918) treatment of the Allioniaceae, the characters of the two species either overlap, such as the perianth lengths, or are highly variable characters; e.g., the apical shape of the leaf blade. Heimerl (1934) suggested that *A. Greggii* be reduced to a variety of *A. obtusa*. However the degree of intergradation between the two taxa, even within the same populations leads me to believe that even the status of variety cannot be maintained.

Texas: Atascosa Co., Pleasanton, Oct. 3, 1917, *E. J. Palmer 12926* (GH, MO, NY, US); Bee Co., 8.3 mi. west-southwest of Beeville, Dec. 1, 1964, *L. H. Shinners 30924* (SMU); Bexar Co., San Antonio, July 1882, *G. W. Letterman 124* (MO, US); Brooks Co., Falfurrias, June 21, 1909, *F. L. Lewton 822* (LL, TEX); Cameron Co., clay dunes near Boca Chica, Oct. 4, 1952, *D. S. Correll 14876* (LL, UC, US); Dimmit Co., west Carrizo Springs, Aug. 1, 1931, *O. M. Clark 4062* (UNM); Duval Co., 6.7 mi. southeast of Freer, Apr. 10, 1955, *L. H. Shinners 19627* (SMU); Frio Co., Dilley, Apr. 29, 1905, *Reverchon 2995* (MO); Galveston Co., 1.6 mi. south of Loma Alto, Sept. 10, 1935, *H. B. Parks & V. L. Cory 17148* (TAES); Goliad Co., Goliad, June 1927, *Rev. C. B. Williams 178* (TEX); Hidalgo Co., 1 mi. northeast of La Joya, Oct. 11, 1940, *V. L. Cory 35972* (TAES); Jim Wells Co., 6.6 mi. south of Alice, Aug. 6, 1935, *H. B. Parks & V. L. Cory 14646* (TAES); Karnes Co., 3.7 mi. south of Kenedy, July 13, 1954, *J. C. Johnson 963* (LL, SMU, TAES, TEX); Kleberg Co.,

Kingsville, Apr. 21, 1905, *S. M. Tracy 9259* (F, GH, MO, NY); La Salle Co., 13 mi. north of Encinal, Nov. 17, 1962, *M. J. Solis 57* (SMU, TEX); Live Oak Co., ca. 6 mi. east of George West, Sept. 26, 1958, *D. S. Correll 20430* (LL); Maverick Co., Eagle Pass, 1880-1885, *V. Havard s. n.* (US); McMullen Co., 1 block west of the Tilden court house, Nov. 5, 1961, *A. Paez 23* (TEX); Nueces Co., 10 mi. northwest of Corpus Christi, Oct. 24, 1948, *C. M. Rogers 6627* (TEX); San Patricio Co., along Nueces Bay, ca. 0.75 mi. west of projected end of highway 893, May 7, 1959, *A. Traverse 1280* (F, MO, SMU, TEX, US); Starr Co., FM 1017, 6 mi. northwest of La Gloria, Apr. 21, 1962, *R. Sanchez et al. 8338* (TAES, TEX); Uvalde Co., Uvalde, Oct. 5–10, 1880, *E. Palmer 1117* (GH, NY, US); Webb Co., 3 mi. northwest of Dolores, May 1, 1954, *M. C. Johnston et al. 3512* (TEX); Willacy Co., southeast part of Sauz Ranch, Nov. 23, 1953, *M. C. Johnston s. n.* (TAES, TEX); Wilson Co., northwest of Floresville, June 24, 1935, *H. B. Parks & V. L. Cory 15067* (TAES); Zapata Co., San Ignacio, Oct. 27, 1962, *W. L. McCart et al. 8483* (LL, TEX).

Mexico: Coahuila, valley 23 mi. southwest of Monterrey, Dec. 1, 1945, *B. H. Warnock & F. A. Barkley 14879* (F, GH, MO, NY, TEX). Nuevo Leon, 32 mi. north-northeast of Sabinas Hidalgo, May 23, 1972, *B. L. Turner & A. M. Powell 2341* (TEX); Linares, Aug. 8, 1930, *H. H. Bartlett 10827* (F, MICH); 5 mi. south of China on dirt road toward Mendez, Dec. 7, 1960, *M. C. Johnston & J. Crutchfield 6064A* (TEX). Queretaro, Higuerillas, June 25, 1972, *M. C. Johnston et al. 8107* (LL). San Luis Potosi, 5 km. southwest of Presa de Guadalupe, km. 147 on road from San Luis Potosi to Antiguo Morelos, Oct. 28, 1955, *Rzedowski 6757* (ENCB, MEXU, MICH, TEX). Tamaulipas, Victoria, May-June 13, 1907, *E. Palmer 405* (F, GH, NY, UC); San Carlos, *Berlandier 3202* (GH, MO, NY, US).

7. **Acleisanthes longiflora** A. Gray, Amer. J. Sci. Ser. 2. 15:261. 1853. Texas: Bexar Co., roadside near San Antonio, May 30, 1849, *C. Wright 310 (exs. 599)*, (GH, holotype; US, isotype). *A. longiflora* ssp. *hirtella* Standl., Contr. U. S. Nat. Herb. 12:371. 1909. Mexico: Coahuila, Perros Bravos, near Saltillo, Sept. 20, 1848, *Gregg 463*, (MO, holotype; GH, isotype). *A. longiflora* var. *hirtella* (Standl.) Heimerl, Notizbl. Bot. Gard. Berlin. 11:459. 1932.

Perennial, pubescent herbs from long, cylindrical, coarse, fleshy taproots; pubescence of minute (0.2–0.4 mm. long), white capitate hairs; stems stout to slender, ascending to prostrate or sprawling over shrubs, to 1 m. long, profusely branched at the base, puberulent to glabrate, occasionally hirtellous; leaves opposite, those of a pair slightly unequal, from half to twice as long as the internodes; petioles stout or slender, puberulent to glabrate, 1–14 mm. long, half the length of the blades or less; blades lanceolate to linear-lanceolate or triangular-lanceolate to deltoid, 3–40 mm. long, 1–30 mm. wide, cuneate to broadly so and decurrent at the base, acuminate to acute or long-attenuate at the apex, thick, succulent, glaucous, undulate or crispate, paler beneath, puberulent to glabrate; flowers solitary, rarely geminate, sessile or with a pedicel to

7 mm. long, chasmogamous and/or cleistogamous; bracts 1 to 3, 1–7 mm. long, one-quarter to equal the length of the fruit, linear-subulate, puberulent to sparsely so; chasmogamous perianth with an unusually long, slender tube and funnelform limb, white, often with a greenish-pink tube outside, fragrant, 7–17 cm. long, the slender tube 1–2 mm. in diameter, the very shallowly 5-lobed limb 1–2 cm. broad, puberulent to glabrate, with 5 stamens, stamens and style shortly exserted; cleistogamous perianth green, 5–12 mm. long, puberulent, with 5 stamens; fruit narrowly oblong, 6–10 mm. long, 2–3 mm. in diameter, truncate at both ends, constricted 1 mm. both below the apex and above the base, with 5 hyaline ridges and a pair of shallow, parallel grooves between the ridges, hirtellous to puberulent with the aforementioned capitate hairs and with many to few, minute (0.2–0.4 mm. long), "beaded" hairs, or glabrate.

Distribution (fig. 37): On calcareous soil, occasionally on gypseous, granitic, or sandy soils, from Arizona and northern Sonora east to central Texas and south to Durango and Tamaulipas, with one isolated locality, to my knowledge, in the Santa Maria Mountains in Riverside Co., California (presumably introduced). At altitudes of 10–2500 m. Occurring with vegetation typical of the Chihuahuan and Sonoran deserts, the Tamaulipan scrub, and the transition zones surrounding these areas.

Acleisanthes longiflora is distinguished by its long, slender, chasmogamous perianths, and its fruit with 5 hyaline ridges. For discussion of species relationships, refer to the treatment of *A. obtusa*.

Gray's original description of this species was based upon Wright exsiccata numbers *599* and *1704*. Standley (1909) selected *599* as the type. Exsiccata *599* represents a combination of two of Wright's original field numbers, *928* and *310*. Fortunately from the descriptions of the collections in Wright's original field notes, the plants can be assigned one of the original field numbers with some degree of certainty. *Wright 928* is listed as Nyctaginaceae from the valley of the Limpia, with flowers white, turning black on drying. One of the plants on the holotype has dried much darker than the other, thus logically corresponding to *Wright 928*, leaving the other plant to be *Wright 310*. Gray's Latin description of the species with deltoid-ovate to rhomboid-lanceolate, acuminate leaves corresponds best with *Wright 310*. Thus *Wright 310* is selected as the holotype.

Standley (1909) proposed *A. longiflora* subsp. *hirtella*, separated by its hirtellous stems, broader, non-attenuate, puberulent, thick leaves, and a more puberulent perianth. Collections made by myself in the fall of 1974 in the mountains 13 miles east of Saltillo and the Cañon del Tule, 15 miles north of Saltillo, contained very pubescent and glabrous types as well as intermediates *(Smith et al. 410, 412, 413, 415,* and *416)*. Since leaf shape also varies greatly within the species, there seems little validity for recognition of this variant as anything more than a form.

Arizona: Maricopa Co., Guadalupe Canyon, South Mountain Park, Oct. 22, 1966, *E. Lehto 7444* (ASU); Pima Co., Happy Valley east of Rincon Mountains, May 20, 1967, *J. C. Truett s.n.* (ARIZ); Pinal Co., Table Top Mountain, Aug. 16, 1930, *Harrison et al. 7299* (ARIZ, US);

Yuma Co., Black Mesa, Plumosa Mountains, Apr. 21, 1932, *R. H. Peebles & H. J. Fulton 8515* (ARIZ, F, MICH).

California: Riverside Co., Santa Maria Mountains, 1906, *E. E. Schellenger s.n.* (MO, US).

New Mexico: Eddy Co., 10–15 mi. west of Carlsbad, May 11, 1968, *T. C. Rosson 1305* (TTC); Sierra Co., south of Salinas Peak, White Sands Missle Range, May 22, 1971, *R. Spellenberg & T. K. Todson 2554* (ENCB, LL); Socorro Co., ridge northeast of Sierra Oscuro and south of Chupadera Mesa, May 8, 1948, *Dunn & Lint 4221* (UNM).

Texas: Atascosa Co., Pleasanton, May 15, 1916, *E. J. Palmer 9746A* (MO, US); Bexar Co., Brooks Field southeast of San Antonio, Oct. 8, 1954, *B. C. Tharp & M. C. Johnston 541735* (TEX); Brazoria Co., Virginia Point, Apr. 15, 1899, *W. L. Bray 34* (TEX); Brewster Co., campus of Sul Ross Teachers College, Alpine, May 19, 1946, *V. L. Cory 53205* (MICH, NY, SMU, UC, US); Burnet Co., Bluffton, 50 mi. west of Georgetown, Oct. 10-15, 1879, *E. Palmer 1115* (US); Coleman Co., Coleman, Apr. 1882, *J. Reverchon 125* (MO, SMU); Crane Co., 8 mi. south of Crane, June 28, 1957, *B. H. Warnock 15529* (LL, SRSC); Crockett Co., stony hills of the Pecos, June 1, 1851, *C. Wright 1704* (GH); Culberson Co., ca. 1 mi. north of Kent, Aug. 29, 1947, *L. C. Hinckley 4031* (NY); Dewitt Co., western part of county, July 20, 1941, *M. Riedel s.n.* (TEX); Dimmit Co., 7 mi. northwest of Carrizo Springs, May 2, 1954, *B. C. Tharp et al. 3563* (SMU); Duval Co., 25.6 mi. northwest of San Diego, Oct. 9, 1935, *H. B. Parks & V. L. Cory 17149* (TAES); Frio Co., south of Frio State Park, Sept. 18, 1943, *F. A. Barkley 13821* (F, GH, LL, MO, NY, SMU, UC); Garza Co., 1.8 air miles east of Post, Aug. 10, 1965, *B. Hutchins 827* (LL, SMU, TTC); Goliad Co., near Goliad, Oct. 2, 1926, *Rev. C. B. Williams 81* (F, MO); Hudspeth Co., east side of Eagle Mountains, 8 mi. south-southwest of Hot Wells, July 7, 1943, *U. T. Waterfall 4939* (GH, NY, SMU); Jim Wells Co., 4 mi. west of Alice, Apr. 10, 1955, *L. H. Shinners 19567* (GH, SMU); Jeff Davis Co., 4 mi. south of Kent, May 21, 1974, *J. Smith & M. Butterwick 92* (LL); Karnes Co., 3.7 mi. south of Kenedy, July 13, 1952, *J. C. Johnson 956* (LL, SMU, TAES, TEX); Kimble Co., sandy soils May 1885, *J. Reverchon 1346* (F, MO, NY, US); Kinney Co., Fort Clark, Apr. 29, 1893, *E. A. Mearns 1429* (US); Kleberg Co., Kingsville, Apr. 21, 1905, *S. M. Tracy 9270* (GH, MO); La Salle Co., 13 mi. north of Encinal, Apr. 21, 1974, *J. Smith et al. 37* (LL); Llano Co., near Llano, Aug. 4, 1931, *S. E. Wolff 3078* (TAES); Loving Co., 2 mi. east of Mentone, July 10, 1965, *R. Irving 108* (ENCB, SMU, TEX); Marlin Co., near Stanton, June 11, 1900, *H. Eggert s.n.* (MO); Maverick Co., Eagle Pass, Apr. 27, 1931, *M. E. Jones s.n.* (POM); McCulloch Co., highway 503, ca. 3 mi. south of Salt Gap, Sept. 28, 1950, *V. L. Cory 58324* (SMU); McMullen Co., 15 mi. north of Freer, Apr. 28, 1958, *B. Thompson & A. Graham 85* (SMU, TEX); Medina Co., 3 mi. west of Devine on road to Yancey, Mar. 31, 1961, *M. C. Johnston 6166* (ENCB); Menard Co., July 7, 1928, *B. C. Tharp s.n.* (TEX); Midland Co., Midland, May 8, 1902, *S. M. Tracy 8312* (F, GH, MO, TEX, US); Mitchell Co., 5 mi. east-southeast of Spade Store, Sept. 21, 1942, *R. W. Pohl 4349* (SMU); Motley Co., Pease

River near Matador, Apr. 30, 1935, *J. K. Small & E. T. Wherry 12178* (SMU, TEX); Pecos Co., 3 mi. west of Fort Stockton, May 22, 1974, *J. Smith & M. Butterwick 104* (LL); Presidio Co., 3 mi. southwest of Shafter on road to Los Adobes, July 30, 1945, *C. H. Muller 8466* (LL, MICH, NY, SMU); Reeves Co., 20 mi. east of Balmorhea, May 7, 1946, *V. L. Cory 52191* (MICH, SMU); Runnels Co., Ballinger, 1889, *G. C. Neally 370* (F, US); San Patricio Co., Lake Corpus Christi, Apr. 5, 1955, *F. B. Jones 1114* (SMU); Scurry Co., near Snyder, June 26, 1927, *B. B. Harris 21* (F); Starr Co., highway 83 below Falcon Dam, Oct. 27, 1962, *W. L. McCart et al. 8461* (LL, TEX); Sutton Co., Sonora Ranch Station, Aug. 20, 1923, *H. Ness s.n.* (TAES); Taylor Co., ca. 1 mi. west of Abilene, Sept. 2, 1961, *N. C. Henderson 61-841* (SMU); Terrell Co., 6.3 mi. southeast of Sanderson, June 5, 1960, *D. Gregory 413* (RSA, UC); Tom Green Co., 7 mi. northeast of San Angelo, June 9, 1957, *L. H. Shinners 26343* (SMU); Uvalde Co., Uvalde, Apr. 28, 1928, *E. J. Palmer 33610* (MO, NY, US); Val Verde Co., 39 mi. west of Del Rio, June 5, 1960, *D. Gregory 414* (RSA, UC); Ward Co., 4 mi. east of Pyote turnoff, highway 80, Aug. 20, 1964, *C. A. Hanson 493a* (ENCB, SMU, TEX); Webb Co., 30 mi. northwest of Laredo, June 8, 1971, *R. Spellenberg & R. C. Moore 2572* (ENCB, LL, NY); Wilson Co., 2.6 mi south of Stockdale, Apr. 9, 1955, *L. H. Shinners 19527* (SMU); Winkler Co., 15 mi. northeast of Kermit, highway 302, July 30, 1965, *T. Collins 467* (TTC); Zapata Co., 5 mi. northwest of San Ygnacio, Mar. 10, 1962, *J. Trevino 66* (SMU, TAES, TEX).

Mexico: Chihuahua, 11.1 mi. southeast of Chihuahua on road to Meoqui, Sept. 18, 1953, *G. B. & F. Ownbey 1842* (ARIZ, GH, MICH, UC, US); mountains near Ciudad Juarez, 1911, *E. Stearns s.n.* (NY); 11 mi. north of Jimenez, Oct. 22, 1974, *J. Smith et al. 365* (LL); Sierra de los Lamentos, east of Villa Ahumada, Aug. 7, 1957, *I. W. Knobloch 206* (ENCB). Coahuila, Allende, May 10, 1939, *E. G. Marsh 1802* (F, GH, TEX); Saltillo, *E. Palmer 181* (F, GH, MO, NY, UC, US); Santa Elena Mines, Sierra de las Cruces, Oct. 9, 1940, *R. M. Stewart 233* (GH); 9 mi. east of Cuatro Cienegas, Oct. 26, 1974, *J. Smith et al. 428* (LL). Durango, 5 mi. southwest of Yerbanis, July 25, 1958, *D. S. Correll & I. M. Johnston 2027* (LL). Nuevo Leon, 16 km. south of Sabinas Hidalgo, June 8, 1971, *R. Spellenberg & R. C. Moore 2574* (LL, NY); Monterrey, July 14, 1942, *G. L. Fisher 371* (F, GH, MO, US). Sonora, 8 mi. southeast of Sonoita, Aug. 24, 1973, *R. Spellenberg & J. Wilson 3612* (ENCB, LL, NY); Cerro del Viejo, southwest of Caborca, Oct. 9–11, 1954, *H. S. Gentry 14464* (LL, UC). Tamaulipas, 22 km. south of Nuevo Laredo, Mar. 22, 1964, *J. A. Vasquez 41* (TEX).

Species Excluded

Acleisanthes nummularia Jones, Contr. Western Bot. 10:43. 1902 = *Anulocaulis leisolenus* (Torr.) Standl.

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A NEW SPECIES OF EUGENIA (MYRTACEAE) FROM GUATEMALA

CYRUS LONGWORTH LUNDELL

Eugenia brevistipitata Lundell, sp. nov. — Arbor; ramuli graciles, minute puberuli; folia glabra, petiolata, petiolo 4–7 mm. longo, canaliculato; lamina chartacea, lanceolata, elliptica vel late elliptica, 3.5–6.5 cm. longa, ad 2.8 cm. lata, apice abrupte caudato-acuminata, acumine obtuso, basi acuta; racemi perabbreviati, 1–3 mm. longi; flores subfasciculati, 1–3; pedicelli fructiferi 3–4 mm. longi, novelli minute adpresse rufo-tomentelli; bracteolae distinctae, parvae, lanceolatae, ca. 0.6 mm. longae; hypanthium brevistipatum; calycis lobi inaequales, late ovati, 1.5–2 mm. longi, apice rotundati, rufo-tomentelli; fructus brevistipitatus, globosus, ad 8 mm. diam.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, about 1.5 km. on Pusila Road, July 27, 1976, *C. L. Lundell & Elias Contreras 20098* (LL, type), tree 40 ft. high, 5 in. diam., fruit reddish.

The reduced racemes, usually with only a single stipitate fruit persisting in the leaf axils, and the small abruptly caudate-acuminate leaves with acutely impressed midvein on upper surface, together with the minutely puberulent branchlets and the minutely tomentellous pedicels, hypanthium and calyx lobes appear to distinguish *E. brevistipitata*.

Cyrus Longworth Lundell

Ardisia aequilonga Lundell, sp. nov. – Arbor parva; ramuli graciles, peradpresse lepidoti; folia petiolata, petiolo marginato, 2–5 mm. longo, lepidoto; lamina chartacea, supra glabra, subtus lepidota, obovata vel elliptico-obovata, 5–8.5 cm. longa, 2.5–4.5 cm. lata, apice abrupte acuminata, basi rotundata, acutiuscula, integra; inflorescentia terminalis parva, paniculata, ad 4.5 cm. longa, lepidoto-furfuracea; pedicelli 3–4 mm. longi; flores 5-meri, corymbosi; sepala imbricata, ovato-lanceolata, ca. 1.8 mm. longa, obtusa, subintegra, aurantiaco-punctata; corolla 6 mm. longa; petala basi connata ca. 1.5 mm., oblongo-elliptica, apice asymmetrica, punctata; stamina ca. 4.2 mm. longa; filamenta 2–2.2 mm. longa; antherae aequilongae, lanceolatae; ovarium glabrum; stylus ca. 5 mm. longus; ovula numerosa, ca. 46, pluriseriata.

Tree, 6 m. tall; branchlets rather slender and short, closely appressed lepidote apically like the leaf buds; leaves rather small, the petioles marginate to base, up to 5 mm. long, but the leaves essentially subsessile, lepidote beneath; leaf blades chartaceous, paler beneath and closely lepidote, glabrous above, obovate or elliptic-obovate, 5–8.5 cm. long, 2.5–4.5 cm. wide, apex rounded and abruptly short acuminate, the acumen acutish, base rounded and decurrent on the petiole, the margin entire, the midvein elevated on both surfaces, the primary lateral veins slender, about 10 pairs, evident but not conspicuous; inflorescences terminal, small, paniculate, up to 4.5 cm. long, lepidote-furfuraceous; pedicels short, 3–4 mm. long; flowers 5-parted, corymbose; sepals imbricate, ovate or ovate-lanceolate, about 1.8 mm. long, obtuse, subentire, conspicuously orange-red punctate with small glands; corolla 6 mm. long; petals united at base about 1.5 mm., oblong-elliptic, asymmetric at apex, conspicuously orange-red punctate; stamens about 4.2 mm. long, attached about middle of corolla tube; filaments slender, equalling the anthers; anthers erect, lanceolate, concolorous, with apical pores; style slender, about 5 mm. long; placenta small, ovules numerous, up to 46.

Panama: Prov. Colon, Santa Rita Ridge Road, 10.2 km. from Boyd-Roosevelt Hwy., premontane wet forest, 350 m. alt., Mar. 15, 1975, *S. Mori & J. Kallunki 5069* (LL, type), tree 6 m. tall, 10 cm. dbh., petals white, anthers yellow.

A. Neei Lundell, also of the premontane wet forest, has a similar ovule count, and appears to be closely related to *A. aequilonga*. The latter has asymmetric rather than symmetric petals and its corolla is larger.

Ardisia brevis Lundell, sp. nov. – Frutex; ramuli graciles, lepidoti; folia subcoriacea, supra glabra, subtus parce lepidota, petiolata, petiolo marginato, 4–6 mm. longo; lamina elliptica, oblanceolata vel obovato-elliptica, 6–12.5 cm. longa, 2.2–4.6 cm. lata, apice subabrupte acuminata, basi acutiuscula; inflorescentia axillaris, brevis, sessilia, paniculata, ad 3 cm. longa, parce lepidota; flores 5-meri, corymbosi; pedicelli 3.5–5 mm.

longi; sepala coriacea, imbricata, late ovata, ca. 1.4 mm. longa, aurantiaco-punctata; corolla 6 mm. longa; petala basi connata ca. 1.4 mm., anguste elliptico-oblonga, apice asymmetrica, aurantiaco-punctata; stamina ca. 4 mm. longa; filamenta ca. 1.2 mm. longa; antherae lineari-lanceolatae, 3 mm. longae, apiculatae; ovarium subglobosum; stylus ca. 5 mm. longus; ovula pluriseriata, numerosa, ca. 32, parva.

Shrub, 2 m. tall, the branchlets rather slender, lepidote at first; leaves subcoriaceous, glabrous above, rather sparsely lepidote beneath, petiolate, the petioles marginate to base, 4–6 mm. long; leaf blades paler brown beneath, elliptic, oblanceolate or obovate-elliptic, 6–12.5 cm. long, 2.2–4.6 cm. wide, apex subabruptly acuminate, the acumen obtusish, base rather broad, obtusish and decurrent on petiole, the midvein elevated beneath, rounded above, the primary lateral veins 10–12-pairs, very slender and obscure, the margin essentially entire; inflorescences axillary (and terminal?), very short, branched from base, sessile, paniculate, up to 3 cm. long, sparsely lepidote (post anthesis); flowers 5-parted, corymbose; pedicels straight, 3.5–5 mm. long; sepals coriaceous medially, hyaline marginally, densely punctate medially with small rounded orange glands, broadly ovate, about 1.4 mm. long, the margin erose; corolla 6 mm. long; petals united at base about 1.4 mm., narrowly elliptic-oblong, apex asymmetric, orange-punctate; stamens about 4 mm. long, attached about middle of corolla tube; filaments about 1.2 mm. long; anthers linear-lanceolate, up to 3 mm. long, concolorous, apiculate, with apical pores; ovary subglobose; style about 5 mm. long; ovules numerous, 32 or more, small.

Panama: Prov. Darien, Rio Tuquesa, at middle Tuquesa Mining Camp called Charco Peje, tropical wet forest, ca. 250 m. alt., July 7, 1975, *S. Mori 7004* (LL, type), shrub, 2 m. tall, riverside.

A. brevis has very small sessile axillary inflorescences. In some inflorescences the rachis is so reduced that the flowers appear to be fasciculate in the leaf axils. The numerous ovules, 32 or more, and the thick ovate sepals densely punctate medially with small orange glands and with erose hyaline margin are other features of the taxon. It is related to *A. fruticosa* Lundell, which has similar reduced inflorescences, but differs in having lanceolate sepals, thin crenulate leaves, and slender petioles canaliculate but not marginate to base.

Ardisia caudatifolia Lundell, sp. nov. — Arbor parva; ramuli minute lepidoti, crassiusculi; folia petiolata, subtus parce lepidota, petiolo 5–6 mm. longo, marginato; lamina subchartacea, anguste oblongo-lanceolata vel oblanceolata, 10–15 cm. longa, 3–4.5 cm. lata, apice subabrupte caudata, basi acuta, subintegra, punctata; inflorescentia terminalis et axillaris, paniculata, ad 9 cm. longa, minute lepidota; flores 5-meri; pedicelli 5–7 mm. longi; sepala lanceolato-elliptica, 1.4–1.6 mm. longa, obtusa, aurantiaco-punctata; corolla ca. 5.2 mm. longa, aurantiaco-punctata; stamina 3.5–4 mm. longa; filamenta 1–1.3 mm. longa; antherae lineari-lanceolatae, 2.6–3 mm. longae; ovarium dense punctatum; stylus ca. 5.2 mm longus; ovula pluriseriata.

Tree, 3 m. tall; branchlets rather slender, minutely lepidote at first; leaves at maturity sparsely lepidote beneath, glabrous above, somewhat paler brown on lower surface, petiolate, the petioles marginate, 5–6 mm. long; leaf blades subchartaceous, narrowly oblong-lanceolate, sometimes slightly wider above the middle, 10–15 cm. long, 3–4.5 cm. wide, apex subabruptly caudate, base acute and decurrent on petiole, the margin subentire above, the midvein elevated beneath, shallowly impressed above, the primary lateral veins up to 14 pairs, slender, inconspicuous, widely arcuately ascending, obscurely reticulate on lower surface, punctate; inflorescences terminal and axillary, paniculate, the terminal up to 9 cm. long, the axillary reduced, finely lepidote; flowers corymbose, 5-parted; pedicels 5–7 mm. long; sepals thin, lanceolate-elliptic, 1.4–1.6 mm. long, obtuse, orange-punctate with small rounded and oblongish glands; corolla about 5.2 mm. long, orange-punctate; petals united at base into tube about 1.4 mm. long, oblong-elliptic; stamens attached about 0.6 mm. above base of corolla tube, 3.5–4 mm. long; filaments 1–1.3 mm. long, rather slender; anthers narrowly lanceolate, widest at base, erect, concolorous, 2.6–3 mm. long, with apical pores; young fruits obovoid with style about 5.2 mm. long; ovules pluriseriate.

Panama: Prov. Veraguas, along stream between Santa Fe and Escuela Agricola Alto Piedras, Aug. 29, 1974, *Thomas B. Croat 27344* (LL, type), tree 3 m., fruits green, immature.

The description of the corolla and stamens is based upon a single fragmentary flower persisting in the young infructescence. All the sepals and the petals and stamens of the flower are strictly 5-parted, otherwise the species rather closely resembles *A. guianensis* (Aubl.) Mez. The latter has 4-parted flowers, a significant difference in this genus.

The very fine lepidote indument and long narrow caudate leaves are notable features of *A. caudatifolia*.

Ardisia chiriquiensis Lundell, sp. nov. — Arbor parva; ramuli crassiusculi; folia parva, glabrata, petiolata, petiolo lepidoto, ca. 3 mm. longo, marginato; lamina chartacea, obovata vel oblanceolata, ad 6 cm. longa, 3.2 cm. lata, apice subabrupte acuminata, basi acuta, integra, punctata, subtus reticulato-venosa; inflorescentia terminalis et axillaris, paniculata, parce lepidota, ad 8.5 cm. longa; flores 5-meri, corymbosi; pedicelli 3–5 mm. longi; sepala imbricata, ovato-elliptica, 2 mm. longa, aurantiaco-punctata, apice obtusa vel rotundata; corolla 6 mm. longa, aurantiaco-punctata; stamina ca. 5 mm. longa; filamenta ca. 2 mm. longa; antherae lanceolatae, ca. 3 mm. longae; ovarium globosum; stylus ca. 5.5 mm. longus; ovula pluriseriata, numerosa.

Probably a small tree, the branchlets rather slender, with terminal leaf buds lepidote-furfuraceous; leaves small, glabrate, the petioles short, lepidote, marginate to base, about 3 mm. long; leaf blades chartaceous, obovate or oblanceolate, up to 6 cm. long, 3.2 cm. wide, apex subabruptly short acuminate with obtusish acumen, base acute and decurrent, punctate, the margin entire, the midvein conspicuously elevated beneath, nearly plane above, the primary lateral veins elevated beneath, the venation reticulate; inflorescences terminal and in axils of terminal leaves, sparsely

lepidote, paniculate, up to 8.5 cm. long; flowers 5-parted, corymbose, congested; pedicels 3–5 mm. long; sepals thin, imbricate, ovate-elliptic, 2 mm. long, conspicuously orange-red punctate with rounded glands, the apex obtuse or rounded; corolla 6 mm. long, conspicuously orange-punctate, rugose when dry, the campanulate tube at base fully 1 mm. long, the petals oblong-elliptic, asymmetrical at apex, acutish; stamens about 5 mm. long, attached at apex of corolla tube; filaments stout, about 2 mm. long; anthers concolorous, lanceolate, about 3 mm. long, with small apical pores; ovary globose, the style about 5.5 mm. long; ovules numerous, pluriseriate.

Panama: Prov. Chiriqui, humid forest between Alto de las Palmas and top of Cerro de la Horqueta, alt. 2100–2268 m., Mar. 18, 1911, *H. Pittier 3226* (LL, type; F, US, isotypes).

A. copeyana Standl., described from a poor fruiting specimen, has sepals resembling those of *A. chiriquiensis*, but the large elliptic leaves and open infructescence of the type differ. The sepals and the rugose dry corolla of *A. chiriquiensis* are similar to the sepals and corolla in *Allen 4023*, a collection from Cerro Campana, referred doubtfully to *A. copeyana* in my treatment of the Myrsinaceae in the *Flora of Panama*. However, the elliptic leaves of *Allen 4023* are much larger.

The Pittier collection has been an enigma for over forty years.

Ardisia clavelligera Lundell, sp. nov. — Arbor parva; ramuli rufo-lepidoti; folia petiolata, petiolo crasso, 4–5 mm. longo, marginato; lamina coriacea, elliptica vel obovato-elliptica, 3.5–7.5 cm. longa, 2–3.5 cm. lata, apice abrupte acuminata, acutiuscula, subtus parce lepidota, pallida, supra glabra; infructescentia parva, lepidota, 2.5–4.5 cm. longa, pyramidalis, corymbosa, congestiflora; pedicelli clavati, crassi, 2.5–3 mm. longi, lepidoti; sepala 4 vel 5, ovata, 1.2–1.4 mm. lata et longa, punctata; bacca subglobosa, ca. 7 mm. diam.

Small tree, 8 m. tall, with dark-red lepidote indument, the branches rather stout, the lateral flowering branchlets short, slender; leaves petiolate, the petioles conspicuously marginate, rather thick, 4–5 mm. long; leaf blades coriaceous with inconspicuous venation, mostly elliptic, sometimes obovate-elliptic, 3.5–7.5 cm. long, 2–3.5 cm. wide, apex abruptly short acuminate, the acumen acutish, base rather broad and acutish, decurrent to base of petiole, paler beneath and persistently but rather sparsely lepidote, glabrous above; infructescences small, terminal, borne on short, slender, lateral branchlets, pyramidal, lepidote, 2.5–4.5 cm. long, about equally as wide at base, corymbose; pedicels club-like, short, thick, 2.5–3 mm. long, lepidote; sepals 4 or 5, ovate, 1.2–1.4 mm. wide and long, the 4-parted ones largest, obtuse-rounded at apex, punctate; fruits subglobose, the largest about 7 mm. in diam.

Panama: Prov. Panama, on road past Cerro Azul, 20 km. from junction with road through Tocumen, Sept. 28, 1974, *S. Mori & J. Kallunki 2214* (LL, type), slender tree, 5 cm. dbh., 8 m. tall, fruits greenish-yellow, rachis and pedicels red.

The small terminal inflorescences borne on slender short lateral branchlets, combined with the 4- or 5-parted sepals and short club-like pedicels

well-mark the taxon. Without flowers, the affinity of *A. clavelligera* is not apparent.

Ardisia colonensis Lundell, sp. nov. – Arbor parva; ramuli crassiusculi, minute rufo-lepidoti; folia glabra, longe petiolata, petiolo 1–2 cm. longo; lamina chartacea vel subcoriacea, elliptica vel obovato-elliptica, 6.5–13 cm. longa, 3–7 cm. lata, apice subabrupte subacuminata, basi acuta, integra, punctata; inflorescentia terminalis bipinnatim racemoso-paniculata, basi lepidota, subsessilia, ad 7.5 cm. longa, 11 cm. lata; pedicelli fructiferi 6–10 mm. longi; sepala 5, late ovato-orbicularia, ca. 2 mm. longa; bacca ellipsoidea, acuta, apiculata.

Tree, 7 m. tall, the branchlets rather slender, at first minutely rufous-lepidote; leaves glabrous, long petiolate, the petioles canaliculate, 1–2 cm. long, rather slender; leaf blades opaque, punctate, chartaceous or subcoriaceous, elliptic or sometimes widest above the middle, 6.5–13 cm. long, 3–7 cm. wide, apex rather abruptly short acuminate, the acumen broad, base acute and decurrent on petiole, the midvein elevated beneath, slightly impressed above, the veins slender and inconspicuous; inflorescences terminal, broadly pyramidal, bipinnately paniculate, the flowers in racemes, base of panicle minutely lepidote, otherwise glabrous; fruiting pedicels rigid, usually curved, 6–10 mm. long; sepals 5, broadly ovate-orbicular, about 2 mm. long, the margin hyaline, ciliate, punctate medially with rounded small black glands; fruits ellipsoid, acute, apiculate, drying about 8 mm. long.

Panama: Prov. Colon, Santa Rita Ridge road, 4 miles from Transisthmian Highway to Agua Clara weather station, alt. ca. 500 m., Dec. 11, 1973, *Al Gentry, R. Dressler & C. Berg 8829* (LL, type), slender tree 7 meters, fruits turning reddish-black.

In the absence of flowers, relationships in this group of taxa remain confused. *A. colonensis* resembles *A. nigrita* Lundell, but the latter has slender racemes tripinnately paniculate, smaller leaves, and sepals almost solidly black-punctate. Both species are related to *A. colombiana* Lundell and *A. Schlimii* Mez of Colombia.

Ardisia Croatii Lundell, sp. nov. – Arbor, ramuli crassiusculi, lepidoti; folia petiolata, petiolo marginato, ad 1 cm. longo, lepidoto; lamina chartacea, oblonga vel lanceolato-oblonga, 7–18 cm. longa, 2.2–5.5 cm. lata, apice acuminata, basi obtusa, integra, supra glabra subtus parce lepidota, utrinque punctata et reticulato-venosissima; inflorescentia terminalis, ad 15 cm. longa et lata, tripinnatim paniculata, multiflora, lepidota; flores 5-meri; pedicelli ad 7 mm. longi; sepala imbricata, parce lepidota, late ovato-orbicularia, ad 3.8 mm. longa et lata, apice rotundata et emarginata, ciliolata; corolla pallida, ca. 7 mm. longa; petala basi coalita, tubo campanulato, ca. 3 mm. longo, lobis ellipticis, ca. 4 mm. longis; stamina 3–3.3 mm. longa; filamenta crassa, ca. 1.2 mm. longa; antherae crassae, oblongo-ovatae, ad 2.5 mm. longae; ovarium glabrum; stylus 4 mm. longus; ovula pluriseriata, numerosa.

Tree, 6–10 m. tall, the branchlets rather thick, lepidote at first; leaves petiolate, the petioles conspicuously marginate to base, up to 1 cm. long, lepidote; leaf blades chartaceous, oblong or lanceolate-oblong, 7–18 cm.

long, 2.2–5.5 cm. wide, apex acuminate, the acumen sometimes caudate, base narrowed and obtusish, decurrent on petiole, margin entire, glabrous above, sparsely lepidote beneath, conspicuously punctate, the glands evident on both surfaces, minutely but densely reticulate-veined on both surfaces, the midven elevated beneath, impressed above, the primary lateral veins slender, ascending at a wide angle, up to 23 pairs with intermediaries; inflorescences terminal, up to 15 cm. long and wide, tripinnately paniculate, multiflowered, lepidote; flowers 5-parted, corymbose; pedicels slender, up to 7 mm. long; sepals imbricate, large, thin, sparsely lepidote, depressed ovate-orbicular, up to 3.8 mm. long and wide, rounded and deeply emarginate at apex, ciliolate, pellucid-punctate medially with pallid inconspicuous glands, with an outer arch of small scattered orange-red glands; corolla pallid, the glands scarcely discernible, about 7 mm. long, the petals united at base into a companulate tube about 3 mm. long, the petals elliptic, about 4 mm. long, asymmetric at apex; stamens attached about 1 mm. above base of corolla tube, 3–3.3 mm. long; filaments thick, about 1.2 mm. long, spreading at base; anthers erect, partially agglutinated, thick, oblong-ovate, up to 2.5 mm. long, obtuse, concolorous, longitudinally dehiscent; ovary narrowly ovoid, glabrous; style slender, 4 mm. long; ovules pluriseriate, numerous.

Panama: Prov. Veraguas, valley of Rio Tercero beyond Escuela Agricola Alto Piedra above Santa Fe, primary forest along road, Aug. 29, 1974, *Thomas B. Croat 27327* (LL, type), tree, 10 m., inflorescence whitish, flowers pale lavender; along road between Escuela Agricola and Alto Piedra (above Santa Fe) and Rio Dos Bocas ca. 5–8 km. from Escuela, 730–770 m. elev., July 26, 1974, *Croat 25907* (LL), tree, 6 m., flowers white in bud.

A. Croatii is a species with very distinctive flowers. The relatively large thin deeply emarginate ciliolate sepals, campanulate corolla tube with stamens borne below middle, pallid petals, and thick filaments and anthers, the latter agglutinated, are features of note. Its relationship appears to be with *A. antonensis* Lundell.

Ardisia Davidsei Lundell, sp. nov. – Arbor parva, 4 m. alta; ramuli graciles, minute rufo-lepidoti; folia oblanceolata, 3–8 cm. longa, 1.2–2.5 cm. lata, apice obtusa, basi cuneata, petiolis ad 5 mm. longis; inflorescentia terminalis, basi minute lepidota, late paniculata, ad 8 cm. longa; pedicelli ad 8 mm. longi; flores 5-meri; sepala late ovata, ad 1.7 mm. longa, 1.8 mm. lata, apice rotundata, aurantiaco-punctata; corolla ad 6 mm. longa; stamina 5–6 mm. longa; filamenta 2.5–3 mm. longa; antherae ad 3.2 mm longae; ovarium glabrum; stylus ad 6.5 mm. longus; ovula pluriseriata.

Small tree, the branchlets rather short and slender, obscurely and minutely lepidote at apex, glabrate; leaves small, paler beneath, petiolate, the petioles short, usually less than 3 mm. long, sometimes up to 5 mm. long, marginate to base, lepidote at first; leaf blades chartaceous, glabrate early, oblanceolate, 3–8 cm. long, 1.2–2.5 cm. wide, apex obtuse, base cuneate, the 8–10 pairs of primary lateral veins inconspicuous, the blade minutely pitted, opaque; inflorescences terminal, paniculate, 4–8 cm. long,

wider than long, densely and minutely lepidote at base, essentially glabrous above, the rachis and branches slender; flowers glabrous, 5-parted, subcorymbose, with slender pedicels up to 8 mm. long; buds lanceolate-oblong, about 6 mm. long, obtuse; sepals broadly ovate, 1.5–1.7 mm. long, up 1.8 mm. wide, rounded at apex, thin, conspicuously orange-punctate with rounded glands of variable size, the petals united at base about 1.2 mm., oblong-elliptic, up to 6 mm. long, 2–2.5 mm. wide, inconspicuously orange-punctate in lines and with small rounded glands apically, the apex obtuse; stamens 5–6 mm. long, attached at base of corolla tube; filaments slender, 2.5–3 mm. long; anthers erect, linear-lanceolate, 2.8–3.2 mm. long, widest at base, concolorous, rounded and usually apiculate at apex, dehiscent by apical pores; ovary ovoid; style slender, up to 6.5 mm. long; ovules pluriseriate, rather large.

Panama: Prov. Chiriqui, ca. 9 km. by road WNW of Boquete, montane forest at lower limit of oaks, on steep slope, elev. 1870 m., Nov. 21, 1975, *G. Davidse & W. G. D'Arcy 10299* (LL, type), small tree 4 m. tall, petals white, anthers yellow. *Davidse & D'Arcy 10151* (LL) from E slope of Volcan de Chiriqui (Baru) is referable here.

A. Davidsei is an outstanding species of possible affinity to *A. jefeana* Lundell, but not to be confused with that taxon. Its small oblanceolate leaves, large flowers, and inflorescences with elongate slender branches and pedicels are notable features.

Ardisia eugenioides Lundell, sp. nov. – Arbor parva; ramuli graciles; folia parva, glabrata, petiolata, petiolo 2.5–4.5 mm. longo, anguste marginato; lamina coriacea, oblanceolata vel obovata, 2.5–4.5 cm. longa, 1–2 cm. lata, apice abrupte acuminata, basi acuta, subtus pallida; infructescentia terminalis, parva, 2.5–5 cm. longa, corymbosa, pauciflora, basi lepidota; pedicelli crassi, ca. 5 mm. longi; sepala 5, crassa, late ovata, ca. 1.4 mm. lata, 1 mm. longa, apice rotundata; bacca subglobosa, ca. 5 mm. diam.; stylus ca. 4.7 mm. longus.

Small tree, 4 m. tall, essentially glabrous in fruit, the persistent indument of petioles and base of infructescence lepidote, the branchlets slender, obscurely carinate; leaves small, glabrate, petiolate, the petioles 2.5–4.5 mm. long, narrowly marginate to base; leaf blades stiff, coriaceous, oblanceolate or obovate, 2.5–4.5 cm. long, 1–2 cm. wide, apex abruptly acuminate, base acute and decurrent on petiole, paler beneath, venation evident but inconspicuous, minutely pitted on upper surface; infructescences terminal, usually shorter than leaves, lepidote at base, corymbose, few-flowered; pedicels rather stout, thickest apically, about 5 mm. long; sepals thick with hyaline margin, orange-punctate, broadly ovate, about 1.4 mm. wide, 1 mm. long, broadly rounded at apex; fruits depressed-globose, about 5 mm. in diam.; style slender, about 4.7 mm. long.

Panama: Prov. Chiriqui, Cerro Hornitos, 40 km. NW of Gualaca, cloud forest dominated by *Quercus* spp., *Podocarpus*, *Drimys* at 2238 m. alt., July 26, 1975, *S. Mori & A. Bolten 7467* (LL, type), small tree, 4 m. tall, fruits red.

The material is scanty and in fruit. Although flowers are essential to determine its affinity, *A. eugenioides* appears to be related to *A. rigidifolia*

Lundell, differing in leaf features, and in having smaller thick sepals wider than long. *A. eugenioides* is a cloud forest species, while *A. rigidifolia* was collected at elevation of 800–1000 m.

Ardisia fruticosa Lundell, sp. nov. – Frutex; ramuli minute lepidoti; folia petiolata, petiolo 5–7 mm. longo, canaliculato; lamina chartacea, supra glabra, subtus parce lepidota, oblanceolata vel obovato-elliptica, 8.5–13 cm. longa, 2.7–5 cm. lata, apice subabrupte acuminata, basi acuta, crenulata; inflorescentia parva, terminalis et axillaris, paniculata, 1–3 cm. longa, lepidota; pedicelli 3–4 mm. longi; flores corymbosi, 5-meri; sepala lanceolata, 1.1–1.3 mm. longa, obtusa, dense aurantiaco-punctata; corolla ca. 4 mm. longa; petala basi connata, oblonga, punctata; stamina ca. 4 mm. longa; filamenta ad 1.4 mm. longa; antherae lineari-lanceolatae, 3 mm. longae, apice attenuatae, acuminatae; bacca subglobosa, ad 9 mm. diam.

Shrub, 3 m. tall, the branchlets rather slender, minutely lepidote at first; leaves with petioles 5–7 mm. long, the petioles canaliculate but not marginate; leaf blades rather thin, drying slightly paler brown beneath, oblanceolate to obovate-elliptic, up to 13 cm. long, 5 cm. wide, apex acuminate, the sharp acumen narrow and up to 1 cm. long, base acutish, the upper two-thirds of margin finely crenulate, the midvein and slender primary lateral veins elevated beneath, inconspicuous above; inflorescences terminal and axillary, small, lepidote, flowers corymbose, strictly 5-parted; sepals rather deltoid-lanceolate, up to 1.3 mm. long, obtuse or obtusish, conspicuously punctate with rather small rounded orange glands; corolla about 4.5 mm. long; petals connate at base, oblongish, punctate; stamens about 4 mm. long, attached about 0.5 mm. above base of corolla tube; filaments slender, up to 1.4 mm. long; anthers very slender, tapering to the acuminate apex, erect, 3 mm. long; style about 5 mm. long; fruits subglobose, up to 9 mm. in diam.

Panama: Canal Zone, along Rio Mendosa near Pipeline Road Bridge, 8 km. NW of Gamboa, alt. 95 m., Nov. 1, 1973, *M. Nee 7740* (LL, type), shrub 3 m. tall, with abundant fruits, the fruits to 9 mm. diam., ripening dark purple.

Although resembling *A. guianensis* (Aubl.) Mez in leaf form and in having terminal and axillary inflorescences, *A. fruticosa* has flowers strictly 5-parted, the flowers in *A. guianensis* being 4-parted.

A series of collections from Panama, nearly all in fruit, represent a complex which can not be interpreted until collections in flower are made. These have both 4- or 5-parted flowers, and inflorescences usually terminal and axillary. Their relationship to *A. guianensis* seems probable.

A. fruticosa is described from a fruiting specimen, the only flower being a dried-up detached fragment from which measurements of the corolla and stamens were made.

Ardisia guancheana Lundell, sp. nov. – Frutex; ramuli graciles, minute lepidoti; folia petiolata, petiolo 3–5 mm. longo, marginato; lamina chartacea, subtus parce lepidota, elliptica vel obovato-elliptica, 4.5–10 cm. longa, 2–4.2 cm. lata, apice subabrupte acuminata, basi late obtusa et acutiuscula, punctata, subintegra; inflorescentia terminalis, parva, fur-

furacea, paniculata, ad 5 cm. longa et lata, parviflora; flores corymbosi, 5- vel raro 4-meri; pedicelli 2–3 mm. longi; sepala imbricata, ovata, 1–1.2 mm. longa, apice obtuso-rotundata, parce aurantiaco-punctata; corolla 4 mm. longa, parce punctata; petala basi connata, elliptica, symmetrica, apice rotundata; stamina ca. 3 mm. longa; ovula 7 vel 8, biseriata.

Shrub, 1.5 m. tall; branchlets slender, finely lepidote at first; leaves petiolate, the petioles short, 3–5 mm. long, marginate to base; leaf blades chartaceous, glabrous above, sparsely lepidote beneath, elliptic or obovate-elliptic, up to 10 cm. long, 4.2 cm. wide, apex subabruptly short acuminate, the acumen acutish, base narrowed and rounded-obtuse and decurrent on the petiole, punctate with rather large scattered blackish glands, the margin essentially entire, the primary lateral veins 9 or 10 pairs, slender but rather conspiciousus beneath, obscure above, the midvein shallowly impressed above, elevated beneath; inflorescences terminal, small, conspicuously furfuraceous, in small short-pedunculate rather dense panicles up to 5 cm. long and equally as wide at base; flowers small, corymbose, 5- rarely 4-parted; pedicels 2–3 mm. long; sepals imbricate, ovate, 1–1.2 mm. long, apex broadly obtuse, rather sparsely orange-punctate medially with small glands; corolla 4 mm. long; petals connate at base about 1.2 mm., elliptic, symmetric, rounded at apex, the medial glands elongated, the apical and lateral small and rounded, orange; stamens about 3 mm. long, attached about 0.3 mm. above base of corolla tube; filaments 1 mm. long; anthers erect, lanceolate, about 2.3 mm. long, concolorous; ovary small; ovules 7 or 8, biseriate.

Panama: Prov. Colon, Rio Guanche, ca. 3 km. upriver from bridge on road to Portobelo, tropical wet forest, alt. 25 m., Mar. 24, 1975, *S. Mori & J. Kallunki 5217* (LL, type), low shrub, 1.5 m. tall, on sandbar.

Superficially, *A. guancheana* resembles *A. gorgonae* Cuat. of Colombia, but that species has thirty or more pluriseriate ovules, and the flowers are 5-parted in the type. *A. guancheana* of the wet tropical lowlands appears to be related to *A. subcrenulata* Lundell and possibly *A. irasuensis* Oerst., two cloud forest taxa of Costa Rica. *A. subcrenulata* has eight to ten triseriate ovules.

Ardisia jefeana Lundell, nom. nov. *A. obovalifolia* Lundell, Wrightia 4: 162. 1971, non *A. obovatifolia* Merrill, 1928.

Ardisia Kallunkii Lundell, sp. nov. — Arbor parva; ramuli novelli lepidoti; folia subsessilia, petiolo marginato, ad 3 mm. longo; lamina glabra, chartacea, elliptica vel raro obovata, 8–13.5 cm. longa, 3.5–6 cm. lata, apice subabrupte subacuminata, basi obtusa; inflorescentia terminalis, subsessilia, paniculata, ad 7 cm. longa, 8.5 cm. lata, basi minute lepidota; flores 5-meri, subcorymbosi vel umbellati; pedicelli ca. 1 cm. longi; sepala hyalina, ovato-elliptica, ad 3 mm. longa, 2.6 mm. lata, apice rotundata, nigro-aurantiaco-punctata; corolla ca. 7 mm. longa; petala anguste oblongo-elliptica; stamina ca. 6.5 mm. longa; antherae ca. 4 mm. longae; ovarium glabrum; stylus ca. 6 mm. longus; ovula pluriseriata.

Small tree, 6 m. tall, the branchlets rather short, stiff, at first obscurely lepidote, glabrate; leaves subsessile, the marginate petioles broad, up to 3 mm. long; leaf blades glabrous, chartaceous, drying blackish above, paler and brownish beneath, elliptic or sometimes obovate, 8–13.5 cm. long, 3.5–6 cm. wide, apex subabruptly short acuminate or apiculate, base rounded and obtuse, decurrent on petiole, the primary lateral veins widely ascending, inconspicuous and rather closely spaced with intermediaries, the midvein elevated beneath, plane above, rather sparsely punctate; inflorescences terminal, subsessile, the lepidote peduncle about 5 mm. long, paniculate, up to 7 cm. long, 8.5 cm. wide, multibranched, the rachis zizzag, the branches elongate and slender, glabrous; flowers 5-parted, subcorymbose or umbellate, glabrous; pedicels up to 1.1 cm. long, slender; sepals large, hyaline, ovate-elliptic, up to 3 mm. long, 2.6 mm. wide, rounded at apex, punctate with rounded orange or blackish glands; corolla about 7 mm. long; petals narrowly oblong-elliptic, united at base, rather sparsely punctate with lines and small rounded orange glands, the apex asymmetrical; stamens about 6.5 mm. long; filaments slender, attached at base of corolla tube; anthers erect, concolorous, linear-lanceolate, about 4 mm. long, dehiscent by apical pores; ovary ovoid, small; style slender, about 6 mm. long; ovules pluriseriate, rather large.

Panama: Prov. Veraguas, on slopes of Cerro Tute, NW of Santa Fe, 1 km. from Escuela Agricola Alto de Piedra, Feb. 24, 1975, *S. Mori & J. Kallunki 4781* (LL, type), tree, 6 m. tall, petals white, anthers yellow.

Related to *A. Fendleri* Lundell, the taxon is well-marked by its elongated slender pedicels, thin large sepals up to 3 mm. long, and inconspicuously punctate corolla up to 7 mm. long with petals asymmetric at apex.

Ardisia Morii Lundell, sp. nov. — Arbor parva; ramuli minute lepidoti; folia chartacea vel subcoriacea, petiolata, petiolo marginato, 3–5 mm. longo; lamina supra glabra, subtus parce lepidota, anguste elliptica vel oblanceolata, 5–8.5 cm. longa, 2–3.5 cm. lata, apice subabrupte acuminata, basi subcuneata, subintegra; inflorescentia terminalis, paniculata, pyramidalis, ad 9 cm. longa, parce lepidota; pedicelli 4–6 mm. longi; flores 5- raro 6-meri, corymbosi; sepala ovata, 1.4–1.5 mm. longa, imbricata, hyalina, minute aurantiaco-punctata; corolla ca. 5.8 mm. longa, pallida, aurantiaco-punctata; petala basi connata ca. 1 mm., lineari-oblonga, asymmetrica, apice acutiuscula; stamina ad 5 mm. longa; filamenta ca. 3 mm. longa; antherae lineari-oblongae, ca. 2.5 mm. longae; stylus 6 mm. longus; ovula 23–25.

Tree, 8 m. tall, the branchlets rather slender, minutely lepidote apically; leaves subcoriaceous, marginate to base of petiole, the petioles 3–5 mm. long; leaf blades glabrous above, very sparsely lepidote beneath, narrowly elliptic or oblanceolate, 5–8.5 cm. long, 2–3.5 cm. wide, apex subabruptly short acuminate, the acumen acutish, base subcuneate and decurrent on petiole, the margin subentire, obscurely crenulate apically, the primary lateral veins 10 or 12 pairs, rather obscure, the midvein slightly elevated on both sides; inflorescences terminal, with reduced

leaves at base, paniculate, pyramidal, about 9 cm. long, very sparsely lepidote, essentially glabrous; pedicels 4–6 mm. long; flowers 5- rarely 6-parted, corymbose; sepals thin, ovate, 1.4–1.5 mm. long, imbricate with hyaline margin, rounded apically, openly punctate with small rounded orange glands; corolla about 5.8 mm. long, pallid, orange-punctate; petals connate about 1 mm. at base, very narrow, linear-oblong, apex asymmetric and acutish; stamens to 5 mm. long with filaments longer than anthers; filaments 3 mm. long, attached about 0.5 mm. above base of tube; anthers concolorous, narrow, linear-oblong, about 2.5 mm. long, with apical pores; ovary ellipsoid, the slender style, 6 mm. long; ovules pluriseriate, small, 23–25.

Panama: Prov. Chiriqui, N of San Felix at Chiriqui-Bocas del Toro border, on Cerro Colorado copper mine road along continental divide, lower Montane Rain Forest, 5000–5500 ft. alt., May 4, 1975, *S. Mori & J. Kallunki 5831* (LL, type), tree, 8 m. tall, petals white, anthers golden yellow.

A. Morii is related to *A. subsessilifolia* Lundell of Chiriqui, but not to be confused with that taxon. The small 5- or 6-parted flowers, very narrow asymmetric petals, filaments longer than anthers, and thin sepals up to 1.5 mm. long set the species apart.

Ardisia Neei Lundell, sp. nov. — Arbor; ramuli lepidoti; folia subsessilia, petiolo marginato, ad 5 mm. longo, lepidoto; lamina chartacea, supra glabra, subtus parce lepidota, oblanceolata vel elliptica, 5–9.5 cm. longa, 2.7–4 cm. lata, apice subabrupte acuminata, basi cuneata, integra, parce punctata; inflorescentia terminalis et exillaris, paniculata, pyramidalis, ad 7.5 cm. longa, parce lepidota; flores corymbosi, 5-meri; pedicelli 3–4 mm. longi; sepala ovata, 1.6 mm. longa, obtusa, punctata; corolla 4.5 mm. longa, lineata; petala elliptica, symmetrica, apice obtusa, basi connata; antherae oblongae, crassae, 2.3 mm. longae, apiculatae; stylus ca. 4.5 mm. longus; ovula numerosa, ad 48, pluriseriata.

Tree, 10 m. tall, 10 cm. dbh.; branchlets rather slender, lepidote apically; leaves essentially sessile, marginate to base of petiole, the petiole up to 5 mm. long, lepidote; leaf blades chartaceous, oblanceolate or elliptic, 5–9.5 cm. long, 2.7–4 cm. wide, apex subabruptly short acuminate, the broad acumen acutish, base cuneate and decurrent to base of petiole, the primary lateral veins slender with intermediaries evident beneath, less so above, the margin entire; inflorescences terminal and axillary, sparsely lepidote, paniculate, up to 7.5 cm. long; flowers corymbose, 5-parted; sepals ovate, fully 1.6 mm. long, obtuse, rather openly punctate with small rounded orange glands; corolla at least 4.5 mm. long, conspicuously punctate with thick medial lines and lateral rounded glands; petals elliptic, symmetric, obtuse, shallowly connate at base; anthers oblong, about 2.3 mm. long, apiculate, at length dehiscent longitudinally; style about 4.5 mm. long; ovules numerous, up to 48, pluriseriate.

Panama: Prov. Panama, premontane wet forest along El Llano-Carti road, 8 km. N of Pan American Hwy. at El Llano, alt. ca. 450 m., Mar. 5, 1974, *M. Nee & R. Warmbrodt 10335* (LL, type), tree, 10 m. tall, 10 cm. dbh., inflorescence yellow-green.

A. Neei has affinity to the cloud forest species, *A. jefeana* Lundell, originally described as *A. obovalifolia* Lundell. The taxon differs markedly in features of the leaves and in its larger sepals and shorter pedicels. The forty-eight ovules of *A. Neei* are unusual in being so numerous.

Ardisia pergracilis Lundell, sp. nov. — Frutex; ramuli lepidoti; folia petiolata, petiolo usque ad 6 mm. longo, marginato; lamina membranacea vel subchartacea, glabra, elliptica, 7–12.5 cm. longa, 2–5 cm. lata, apice subabrupte acuminata, basi acutiuscula, subcrenulata; inflorescentia terminalis, lepidota, paniculata, ad 7 cm. longa, gracillima; pedicelli 3–5 mm. longi; flores corymbosi, 4- vel 5-meri; sepala ovata, 1–1.2 mm. longa, paucipunctata, erosa; corolla 4 mm. longa, paucipunctata; petala basi connata ca. 1.2 mm., elliptico-oblonga, apice asymmetrica; stamina 3.2 mm. longa; filamenta ca. 1.3 mm. longa; antherae lanceolatae, 2 mm. longae; ovarium glabrum; stylus 3.6 mm. longus; ovula 13–16, pluriseriata.

Shrub to 1.5 m.; branchlets rather slender, obscurely lepidote; leaves marginate to base, subsessile or with marginate petioles up to 6 mm. long; leaf blades thin, membranaceous or subchartaceous, essentially glabrous at maturity, rather narrowly elliptic, up to 12.5 cm. long, 5 cm. wide, apex subabruptly short acuminate, the acumen acutish, the margin rather obscurely crenulate, the primary lateral veins 10–14-pairs, slender, not conspicuous, the midvein elevated beneath; inflorescences terminal, lepidote, paniculate, slender in all parts, up to 7 cm. long; pedicels slender, 3–5 mm. long; flowers corymbose, 4- or 5-parted; sepals very thin, 1–1.2 mm. long, erose, punctate with a few small orange glands medially; corolla 4 mm. long, with only a few small rounded scattered glands; petals united about 1.2 mm. at base, elliptic-oblong, with small notch at apex, rather obscurely asymmetric; stamens 3.2 mm. long; filaments about 1.3 mm. long, attached near base of corolla tube; anthers erect, subbasifixed, lanceolate, 2 mm. long, concolorous, with apical pores; style slender, subequalling corolla; ovules 13–16, pluriseriate.

Panama: Prov. Panama, tributary of Rio Chagres, 5 miles SW of Cerro Brewster, alt. ca. 1000 ft., sandy and rocky river banks, Dec. 14, 1967, *W. H. Lewis et al. 3493* (LL, type), shrub to 1.5 m., flowers white.

I referred this collection to *A. guianensis* (Aubl.) Mez in my 1971 treatment of the Myrsinaceae for the *Flora of Panama*, and *A. pergracilis* appears to belong in that complex. Its more numerous ovules, smaller anthers, and terminal very slender branched inflorescences make preferable the segregation of *A. pergracilis* as a distinct taxon. Now that the Panamanian taxa are better known, *A. amanuensis* Lundell also may be recognized as a valid species of this complex.

Ardisia santafeana Lundell, sp. nov. — Arbor parva; ramuli graciles; folia petiolata, petiolo marginato, 5–7 mm. longo; lamina subchartacea, glabrata, elliptica vel obovato-elliptica, 8–14.5 cm. longa, 3.5–6 cm. lata, apice acuminata, acumine obtuso, basi acutiuscula, integra; inflorescentia terminalis, subsessilia, parva, tripinnatim paniculata, ad. 6.5 cm. longa et lata, basi lepidota; pedicelli 5–8 mm. longi; sepala 5, imbricata, ovato-elliptica, ca. 2.6 mm. longa, apice rotundata, punctata; ovarium glabrum; stylus 7–7.5 mm. longus; ovula pluriseriata.

Tree, 4 m. tall, the branchlets rather slender, glabrate; leaves petiolate, the petioles lepidote, broadly marginate to base, 5–7 mm. long; leaf blades rather thin, glabrate, elliptic or obovate-elliptic, 8–14.5 cm. long, 3.5–6 cm. wide, apex obtusely short acuminate, base acutish, decurrent on petiole, the margin entire, paler beneath, the midvein elevated beneath, nearly plane above, the primary lateral veins very slender, about 15 pairs, inconspicuous on both surfaces; inflorescences terminal, small with very short lepidote peduncle up to 5 mm. long, tripinnately paniculate, up to 6.5 cm. long, and equally as wide at base; flowers umbellate, 5-parted, rarely with two sepals united and 4-parted; pedicels rigid and straight, 4–8 mm. long; sepals imbricate, very thin and hyaline, ovate-elliptic, about 2.6 mm. long, rounded at apex, not ciliolate, rather uniformly punctate with small rounded orange-red glands scattered over entire surface; ovary ovoid; style slender, 7–7.5 mm. long; ovules small, pluriseriate.

Panama: Prov. Veraguas, NW of Santa Fe, 1 km. from Escuela Agricola Alto de Piedra, forest at edge of pasture, Feb. 26, 1975, *S. Mori & J. Kallunki 4865* (LL, type), tree, 4 m. tall, ovary red; 5 miles W of Santa Fe on road past Escuela Agricola Alto Piedra on Pacific side of divide, alt. 800–1200 m., Mar. 18, 1973, *Thomas B. Croat 23052* (LL), tree 6 m., fruits reddish to green.

Although flowers are not available, the taxon has very distinctive thin sepals and style up to 7.5 mm. long. The length of style indicates that the flowers are probably about 7 mm. long.

A. santafeana has thin sepals like *A. Croatii* Lundell of the same area, but the two taxa are not similar otherwise.

Conomorpha montana Lundell, sp. nov. – Frutex; ramuli graciles, dense rufo-lepidoti; folia petiolata, petiolo lepidoto, 7–11 mm. longo, canaliculato; lamina subcoriacea vel coriacea, oblanceolata, 5–7 cm. longa, 1.8–2.5 cm. lata, apice subabrupte caudato-acuminata, basi acuminata, integra, supra glabra, subtus lepidota; inflorescentia racemosa, rufo-lepidota, ad 3.5 cm. longa; pedicelli 1.5–2.5 mm. longi; flores dioici, 4-meri, ca. 3.2 mm. longi; calyce ca. 1.5 mm. longi, lobis triangulari-ovatis, ca. 1 mm. longis, acutis, parce aurantiaco-punctatis; corolla 3 mm. longa; petala valvata, basi connata, lanceolata, apice obtusiuscula, inflexa, parce aurantiaco-punctata, intus minute lepidota; stamina ca. 1.3 mm. longa; filamenta crassa, ca. 0.5 mm. longa; antherae ovatae, ca. 1 mm. longae, apice acutae, reflexae; ovarium abortivum, clavatum, parce punctatum.

Shrub, 2 m. tall; branchlets slender, rufous-lepidote, with leaves crowded at apex; leaves petiolate, the petioles slender, up to 11 mm. long, lepidote; leaf blades coriaceous or subcoriaceous, oblanceolate, up to 7 cm. long, 2.5 cm. wide, apex rather abruptly caudate-acuminate, base acuminate, the margin entire, glabrous and smooth above, persistently lepidote beneath, the midvein elevated beneath, acutely impressed above, the primary lateral veins 5–7-pairs, slender and rather inconspicuous; racemes aggregated at apex of branchlets, rufous-lepidote, up to 3.5 cm. long; pedicels 1.5–2.5 mm. long, each with a small bractlet at base, or rarely bracteate above base; flowers dioecious, the staminate, 4-parted, about 3.2 mm. long at anthesis, rufous-lepidote; calyx about 1.5 mm. long, the lobes

triangular-ovate, about 1 mm. long, acute, with a few orange glands apically; corolla 3 mm. long; petals valvate, united one-third at base, lanceolate, the apex obtusish, inflexed, with scattered orange glands, minutely lepidote within; stamens attached at top of corolla tube, about 1.3 mm. long; filaments thick, short; anthers erect, ovate, about 1 mm. long, the apex acute, reflexed; ovary and style clavate, about 1.75 mm. long, with a few scattered glands, the ovary abortive.

Panama: Prov. Panama, Cerro Jefe, cloud forest dominated by *Clusia* spp. and *Colpothrinax Cookii*, premontane rain forest, ca. 1000 m. alt., June 5, 1975, *S. Mori & J. Kallunki 6590* (LL, type), unbranched shrub, 2 m. tall.

C. Gentryi Lundell, described from Cerro Jefe, is a fruiting specimen with much larger thin leaves short acuminate at apex. I have reluctantly described *C. montana*, a staminate plant, which differs in having much smaller coriaceous caudate-acuminate leaves. A series of collections of the taxa on Cerro Jefe are needed, in flower and fruit, to clarify the taxonomic status of the two plants described. Material of the genus *Conomorpha* from Central America is scanty and inadequate.

Conomorpha panamensis Lundell, sp. nov. — Arbor parva; ramuli parce lepidoti et glanduloso-puberuli; folia pseudoverticillata, parce aurantiaco-punctata, petiolata, petiolo 0.5–1.5 cm. longo, parce glanduloso; lamina coriacea, oblanceolata, 7.5–12 cm. longa, 1.7–3.5 cm. lata, apice acuta vel subacuminata, basi cuneata; inflorescentia racemosa, lateralis, basi bracteata, ad 2.5 cm. longa, glanduloso-puberula; flores 5-meri; pedicelli 3–4 mm. longi; sepala lanceolata, 1 mm. longa, acuta, aurantiaco-punctata, glanduloso-ciliolata; petala aurantiaco-punctata, ciliolata; ovarium conicum, glabrum; fructus globosus, apiculatus, ca. 5 mm. diam.

Small tree, 3 m. tall; branchlets slender, at first rather sparsely glandular-puberulent and lepidote; leaves subverticillate, crowded at apex, glabrate, orange-punctate, the glands rather scattered, petiolate, the petioles stout, 0.5–1.5 cm. long, shallowly canaliculate but with elevated rounded medial ridge; leaf blades coriaceous, oblanceolate, 7.5–12 cm. long, 1.7–3.5 cm. wide, apex acute or subacuminate, base cuneate and decurrent on petiole, the margin essentially entire, the midvein elevated on both surfaces, the primary lateral veins 10–12-pairs, arcuately ascending, slender but conspicuous on lower surface, less evident above, the secondary venation openly reticulate; inflorescences racemose, lateral, up to 2.5 cm. long, the racemes remote, densely stipitate-glandular, subtended by acuminate lanceolate densely orange-punctate glandular-ciliolate bracts up to 1.5 cm. long; flowers 5-parted; pedicels 3–4 mm. long, stipitate-glandular, each subtended by elongated bractlet shorter than pedicel; sepals (in bud) lanceolate, those subtending fruits ovate, fully 1 mm. long, acute, orange-punctate, glandular-ciliolate; petals (in bud) orange-punctate, glandular-ciliolate; stamens attached at base of corolla, the filaments (in bud) very short; ovary conical, glabrous; fruits globose, 5 mm. in diam., apiculate.

Panama: Prov. Chiriqui, Cerro Pando, on the continental divide and

the Panama-Costa Rica border, ca. 16 km. NW of El Hato del Volcan, 2000–2482 m. alt., July 20, 1975, *S. Mori & A. Bolten 7292* (LL, type), small tree, 3 m. tall, fruits purple, buds just emerging.

Referable to the subgenus *Microconomorpha* Mez, the relationship of the taxon is not apparent in the absence of mature flowers. *C. panamensis* is the first species of this subgenus discovered in Central America, all the others being South American. Its glandular-stipitate indument, remote lateral racemes subtended by large ciliolate and densely orange-punctate bracts, and the coriaceous conspicuously veined subverticillate leaves well-mark this distinctive species.

Conomorpha rufa Lundell, sp. nov. – Frutex; ramuli graciles, novelli dense rufo-lepidoti; folia petiolata, petiolo rufo-lepidoto, ad 11 mm. longo; lamina coriacea, supra glabrata, subtus dense rufo-lepidota, oblanceolata, ad 8 cm. longa, 2.3 cm. lata, apice subabrupte caudato-acuminata, basi anguste cuneata, integra; inflorescentia dense rufo-lepidota, axillaris, racemosa, 1–1.7 cm. longa; pedicelli 1.2–2 mm. longi, crassiusculi; flores 4- vel 5-meri, parce rufo-lepidoti; sepala ovata, 0.8–1 mm. longa, acuta; corolla 2 mm. longa; petala basi connata, lanceolata, valvata, acuta; stamina ca. 1 mm. longa; antherae lanceolatae, ca. 0.8 mm. longae, acutae; ovarium apice parce lepidotum; stylus crassus, ca. 0.8 mm. longus.

Slender shrub, the branchlets rufous-lepidote apically; leaves crowded at apex, persistently and densely rufous-lepidote beneath and at base on both surfaces, petiolate, the petioles slender, canaliculate, up to 11 mm. long; leaf blades greenish above, coriaceous, oblanceolate, 4.5–8 cm. long, 1.5–2.3 cm. wide, apex subabruptly caudate-acuminate, base narrow and cuneate, the margin entire, the midveins elevated beneath, impressed above, the primary lateral veins very slender, 5–7-pairs, inconspicuous, arcuately ascending, anastomosing near margin, not discernible on the smooth upper surface of blade; inflorescences axillary, racemose, the bracteate rachis up to 1.7 cm. long, densely rufous-lepidote, appearing furfuraceous when boiled; pedicels about 1.2 mm. long in flower, up to 2 mm. long in fruit, thick in fruit; flowers 4- or 5-parted, rather sparsely rufous-lepidote with conspicuous scales; sepals narrowly ovate in flower, broader in fruit, 0.8–1 mm. long, shallowly connate at base, acutish; corolla 2 mm. long, sparsely lepidote on both surfaces; petals connate at base, valvate, lenceolate, acute; stamens about 1 mm. long, attached at apex of corolla tube; filaments short, less than half as long as the anthers; anthers lanceolate, about 0.8 mm. long, acute; ovary sparsely lepidote apically, the style thick and persistent, about 0.8 mm. long, the stigma thick and lobed.

Panama: Canal Zone, between Fort San Lorenzo and Fort Sherman near Pavon Road junction with Road 82 (S2), Oct. 22, 1974, *S. Mori & J. Kallunki 2737* (LL, type), slender, unbranched, 2 cm. dbh.

The dense rufous-lepidote indument and the coriaceous leaves are conspicuous features of this lowland shrub. The description of the flower is based on unsatisfactory material, consisting of persistent fragments in the infructescence.

Grammadenia aurantiaca Lundell, sp. nov. — Frutex epiphyticus, ramulis crassiusculis, glabris; folia parva, chartacea, punctata, glabra, sessilia, oblanceolata vel anguste oblongo-oblanceolata, 2–5.5 cm. longa, 0.8–1.1 cm. lata, apice obtusiuscula, apiculata, basi ad 4 m. lata; inflorescentia parce glanduloso-puberula, racemosa, 2–4 cm. longa, bracteata; pedicelli 1.2–1.7 mm. longi; sepala parva, ca. 1 mm. longa, basi connata, ovata, aurantiaco-punctata, apice obtusa, erosula; corolla ca. 2.5 mm. longa, ca. 5.5 mm. diam.; petala late ovato-elliptica, ca. 2 mm. longa, aurantiaco-punctata, apice rotundata; antherae ovatae, aurantiaco-punctatae; ovarium lepidotum; ovula 2.

Epiphytic shrub, the branchlets glabrous with the leaves crowded at apex; leaves sessile, small, chartaceous, punctate with rounded and elongate glands on the lower surface, those along margin rounded and blackish or dark orange colored and conspicuous, the blades oblanceolate or narrowly oblong-oblanceolate, 2–5.5 cm. long, 0.8–1.1 cm. wide, apex obtusish and apiculate, base narrowed but wide, up to 4 mm. wide; inflorescences sparsely glandular-puberulent, racemose, 2–4 cm. long, bracteate, the bracts subequalling pedicels, ovate, acute, punctate with thick orange glands, the medial linear; pedicels 1.2–1.7 mm. long; sepals 5, thin, about 1 mm. long, united at base, ovate, conspicuously punctate with large mostly linear orange glands, apex obtuse; corolla about 2.5 mm. long, 5.5 mm. in diam.; petals ovate-elliptic, about 2 mm. long, thin, conspicuously punctate with thick orange glands, the medial linear, the apex rounded; anthers small, with short thick filaments spreading at base, the anthers ovate-orbicular, about 0.5 mm. long, conspicuously orange-punctate dorsally; ovary depressed with short style, lepidote; ovules 2, apparently abortive.

Panama: Prov. Chiriqui, Cerro Pando, on the continental divide and the Panama-Costa Rica border, ca. 16 km. NW of El Hato del Volcan, alt. 2000–2482 m., July 20, 1975, *S. Mori & A. Bolten 7296* (LL, type), epiphytic shrub.

G. aurantiaca resembles *G. minor* Lundell, a bog shrub from elfin cloud forest in Costa Rica, described from a fruiting specimen. *G. aurantiaca* has larger leaves, inflorescences twice as long, and flowers conspicuously punctate with thick orange glands, these linear medially on bracts, sepals and petals. The stamens have a distinct thick filament wide at base, and the anthers are conspicuously orange-punctate dorsally. The lepidote ovary is a distinctive feature.

Grammadenia macrocarpa Lundell, sp. nov. — Frutex epiphyticus, ramulis crassiusculis, glabris; folia chartacea, glabra, sessilia, oblanceolata, 4–8 cm. longa, 0.9–1.7 cm. lata, apice obtusiuscula et apiculata, basi attenuata, aurantiaco-pellucido-punctata; inflorescentia racemosa, gracilis, parce glanduloso-puberula, 2.5–4 cm. longa, minute bracteata; pedicelli fructiferi ca. 2.5 mm. longi; sepala 5, parva, ovata, ca. 0.5 mm. longa, acuta, ciliolata, aurantiaco-punctata; bacca oblongo-ellipsoidea, ca. 8 mm. longa, 3.5–4 mm. diam., aurantiaco-punctata.

Epiphytic shrub, the branchlets rather thick, glabrous, with the leaves crowded at apex; leaves chartaceous, glabrous, oblanceolate, 4–8 cm.

long, 0.9–1.7 cm. wide, apex obtusish and apiculate, attenuate to the broad base, marginal vein well developed, pellucid-punctate with rounded, pale-orange glands; inflorescences racemose, axillary, slender, rather sparsely glandular-puberulent, 2.5–4 cm. long, the bracts minute, about 1 mm. long subtending fruiting pedicels; fruiting pedicels about 2.5 mm. long; sepals minute, ovate, about 0.5 mm. long, acute, ciliolate, orange-punctate with several small rounded glands; fruits oblong-ellipsoid, about 8 mm. long, 3.5–4 mm. diam., conspicuously orange-punctate, the apex rounded and apiculate.

Ecuador: Napo, 17 km. W of Lumbaque (70 km. W of Lago Agrio), alt. 1130 m., premontane wet forest, Nov. 4, 1974, *Al Gentry 12419* (LL, type), epiphytic shrub, buds red, fruits greenish-pink.

The minute bracts subtending the pedicels, small ciliolate orange-punctate sepals, and unusually large orange-punctate fruits are features distinguishing *G. macrocarpa*.

The fruits of *Grammadenia* are distinctive and all too seldom collected. They vary at maturity from black (black-punctate), to pinkish, to almost pure white. In shape they are ovoid, obovoid or oblong-ellipsoid.

Grammadenia Morii Lundell, sp. nov. – Frutex epiphyticus, ramulis crassis, glabris; folia sessilia, glabra, subcoriacea vel coriacea, oblanceolata vel anguste oblongo-oblanceolata, 3–8 cm. longa, 1–2 cm. lata, raro ca. 1.5 cm. longa, 0.7 cm. lata, apice acuta, apiculata, minute falcata, basi attenuata; inflorescentia gracilis, racemosa vel subpaniculata, 1–4 cm. longa, minute stipitato-glandulosa, bracteata; pedicelli 1–3 mm. longi; flores 5- raro 6-meri, ad 3 mm. longi; sepala ovata, 0.6–1 mm. longa, late obtusa, pellucido-punctata vel obscure aurantiaco-punctata, integra; corolla 1.8–2 mm. longa, 4–4.5 mm. diam., petala late ovata, 1.2–1.5 mm. longa, late obtusa vel rotundata, parce aurantiaco-punctata, intus papillosa; antherae ovatae, obscure emarginatae, sessiles; ovarium glabrum; ovula 2; fructus obovoideus, 2.5–4 mm. longus, albidus.

Epiphytic shrub, or small tree to 3 m. tall, the branchlets rather thick, glabrous, with leaves mostly crowded at apex; leaves sessile, glabrous, slightly paler beneath, subcoriaceous, coriaceous, or sometimes rigidly coriaceous, oblanceolate or narrowly oblong-oblanceolate, 3–8 cm. long, 1–2 cm. wide, sometimes smaller, about 1.5 cm. long, 0.7 cm. wide, apex acute, apiculate, the minute tip recurved over upper surface, base attenuate, wide, sometimes obscurely auriculate, the margin revolute and prominently punctate with rounded and elongated black glands, the glands of blade otherwise scattered and not conspicuous; inflorescences with minute stipitate-glands, axillary, slender, 1–4 cm. long, racemose, but occasionally with a short branch, the bracts thin, lanceolate-elliptic, acuminate at apex, sometimes subequalling pedicels; pedicels 1–3 mm. long; flowers usually 5- rarely 6-parted, up to 3 mm. long; sepals united below, ovate, 0.6–1 mm. long, broadly obtuse, entire, pellucid-punctate or obscurely orange-punctate; corolla 1.8–2 mm. long, 4–4.5 mm. wide, the petals broadly ovate, 1.2–1.5 mm. long, obtuse-rounded, sparsely orange-punctate with pallid glands, papillose within; anthers sessile, alternating with shallow fleshy lobes, small, ovate, obscurely emarginate

or obtuse, borne at apex of corolla tube; ovary glabrous, depressed-globose, with short style; ovules 2; fruits obovoid, 2.5–4 mm. long, rounded at apex, white or pinkish, the glands pallid and obscure.

Panama: Prov. Panama, Cerro Jefe, cloud forest dominated by *Clusia* spp. and *Colpothrinax Cookii*, premontane rain forest, along trail on ridge running NE from summit, ca. 1000 m. alt., Dec. 18, 1974, *S. Mori & J. Kallunki 3761* (LL, type), branch on ground, epiphyte.

Also represented by the following collections from Cerro Jefe, *Mori & Kallunki 2392* (LL), fruits; *3759* (LL), fruits; *6085* (LL), flowers; *6494* (LL), flowers; *6496* (LL), flowers; *Mori 7119* (LL), fruits; *J. T. & F. Witherspoon 8495* (LL), fruits.

Of affinity to *G. linearifolia* Lundell, *G. Morii* may be recognized by its shorter inflorescences and pedicels and leaves with several marginal series of conspicuous black glands. The white or pinkish obovoid fruits of the taxon are distinctive.

G. Morii is represented by eight collections from Cerro Jefe with fine flowering and fruiting specimens, the best series of any new taxon I have described from Panama. For such a careful selection of an adequate series of specimens, in different seasons, the collector for whom the species is named is to be commended.

Grammadenia panamensis Lundell, sp. nov. — Frutex epiphyticus, ramulis crassis, glabris; folia sessilia, chartacea, lineata, oblanceolata, 4.5–7 cm. longa, 1.2–1.8 cm. lata, apice acuminata, apiculata, basi attenuata; inflorescentia racemosa, glanduloso-puberula, ad 5 cm. longa; bracteae lineatae; pedicelli ad 3 mm. longi; sepala 5, basi coalita, ovata, 1.2–1.4 mm. longa, obtusa vel acutiuscula, nigropunctata; corolla 2–2.2 mm. longa; petala, 5, late ovata vel suborbicularia, ad 1.5 mm. lata, 1.2 mm. longa, nigropunctata, apice late obtusa vel rotundata; antherae subsessiles, ovatae, parvae, apice rotundatae; ovarium glabrum; ovula 2.

Epiphytic shrub, the branchlets rather thick, glabrous; leaves sessile, chartaceous, lineate with black lines on paler lower surface, with denser rounded black glands along margin, the marginal vein scarcely evident beneath, the blades oblanceolate, 4.5–7 cm. long, 1.2–1.8 cm. wide, apex acuminate, apiculate, base attenuate and rather wide; inflorescences axillary, racemose, glandular-puberulent, up to 5 cm. long; bracts thin, black punctate and lineate; pedicels club-shaped, up to 3 mm. long; sepals 5, united at base, thin, ovate, 1.2–1.4 mm. long, obtuse or acutish, sparingly black punctate with rather large rounded and oblongish glands; corolla 2–2.2 mm. long; petals 5, thin, broadly ovate or suborbicular, up to 1.5 mm. wide, 1.2 mm. long, rather sparingly black punctate with rounded and oblongish glands, apex broadly obtuse or rounded; anthers subsessile, alternating with shallow lobes at apex of corolla tube, small, ovate, rounded at apex, with several small black glands dorsally; ovary glabrous, with short style; ovules 2, apparently abortive.

Panama: Prov. Panama, premontane wet forest, along trail to top of Cerro Campana, SW slope from road, alt. 825–1000 m., May 12, 1974, *M. Nee & H. Stockwell 11602* (LL, type), epiphytic shrub, flowers pale greenish with tinge of purple.

In leaf form *G. panamensis* resembles *G. acuminata* Lundell of Costa Rica, but in the latter the leaf blades are not black lineate, the marginal glands are orange rather than black, and the marginal vein is conspicuous beneath. Also, the black glands of the sepals and petals of *G. acuminata* are small and dense, much smaller and more numerous than in *G. panamensis*. The ovules in *G. panamensis* appear to be abortive.

Parathesis bicolor Lundell, sp. nov. – Arbor parva, megaphylla; ramuli crassi, rufo-tomentelli; folia petiolata, petiolo crasso, 3–4.5 cm. longo, rufo-tomentello; lamina coriacea, lanceolata vel lanceolato-elliptica, ad 25 cm. longa, 6–9 cm. lata, apice subacuminata, basi rotundata, supra glabrata, subtus bicolor, rufo-tomentella; inflorescentia axillaris et terminalis, ad 20 cm. longa, crassiramea, adpresse et minute rufo-tomentella, anguste paniculata; pedicelli fructiferi crassi, 2–3.5 mm. longi; sepala crassa, late triangularia, 2 mm. longa, acuta, minute et dense rufo-tomentella; fructus subglobosus, ca. 8 mm. diam.

Small tree, 12 m. tall, the branchlets thick, densely tomentose with minute multibranched dark red hairs which appear to be glandular; leaves large, thick, conspicuously bizonal and bicolor on lower surface, petiolate, the petioles thick, 3–4.5 cm. long, pubescent like the branchlets; leaf blades coriaceous, lanceolate or lanceolate-elliptic, up to 25 cm. long, 6–9 cm. wide, apex short acuminate, the acumen acute or obtuse, base rounded, margin entire or essentially so, glabrate above, persistently appressed tomentose and conspicuously bizonal on lower surface, the hairs small, matted and multibranched, the medial zone reddish, the marginal much paler and with appressed indument, the primary lateral veins numerous, conspicuous beneath, slightly impressed above; inflorescences narrowly paniculate, axillary and terminal, up to 20 cm. long, subequalling leaves, minutely rufous-tomentose, with thick peduncle and rachis, the branches short; pedicels in fruit short, thick, 2–3.5 mm. long; sepals thick, broadly triangular, about 2 mm. long, acute, with minute and dense red indument; fruits depressed-globose, about 8 mm. in diam., with dark-red indument persistent around the style base.

Panama: Prov. Panama, El Llano-Carti Road, 10.8 km. from Inter-American Hwy., alt. 1100-1200 ft., in wet forest, Dec. 27, 1974, *S. Mori & J. Kallunki with B. Hansen 4118a* (LL, type), tree, 12 m. tall, 12 cm. dbh., mature fruit red.

I referred a collection of this species, *Echeverria 358* (UC, LL) from Costa Rica, to *P. calophylla* Donn. Sm., with reservations, in my monograph of the genus. *P. bicolor* appears to be related to *P. calophylla*, but flowers are needed to confirm this.

P. bicolor has larger leaves, compacted tomentum appearing to be glandular, conspicuous bizonal indument on undersurface of the thick leaf blades, larger inflorescences with thick rachis and short branches, short thick pedicels less than 3.5 mm. long, with the fruits appearing to be subsessile. The sepals are short, wide, and acute, not acuminate.

P. bicolor is very poorly represented in herbaria.

Rapanea calcarata Lundell, sp. nov. – Arbor parva, glabra, calcarata; ramuli crassiusculi; folia glabra, petiolata, petiolo crasso, 4–5 mm. longo;

lamina coriacea, oblanceolato-elliptica vel oblongo-elliptica, 5–9 cm. longa, 2.5–3.5 cm. lata, apice perobtusa, basi revoluta, obtusa, enervia; flores fasciculati, staminati, 5-meri; pedicelli crassi, 1.5–2.5 mm. longi; sepala late ovata, 1.2–1.5 mm. longa, lineata et minute nigropunctata, apice rotundata, margine minute papillato; corolla 4 mm. longa; petala basi coalita, lanceolata, obtusa, extus glabra, intus papillata, atrolineata et nigropunctata; stamina 2.5–2.8 mm. longa; filamenta ca. 0.8 mm. longa; antherae late ovato-ellipticae, ca. 2 mm. longae, apiculatae, epunctatae; ovarium abortivum, glabrum.

Tree, up to 6 m. tall, glabrous, the branchlets thick, with prominent spurs up to 1.3 cm. long; leaves glabrous, petiolate, the petioles thick, 4–5 mm. long; leaf blades rigidly coriaceous, oblanceolate-elliptic or oblong-elliptic, up to 9 cm. long, 3.5 cm. wide, apex broadly obtuse, base obtuse and revolute, shallowly decurrent on the petiole, costa prominent, the nerves obscure; flowers staminate, fasciculate at ends of spurs, 5-parted; pedicels thick, short, 1.5–2.5 mm. long; sepals ovate or broadly ovate, 1.2–1.5 mm. long, rounded at apex, the margin at first minutely papillate, medially lineate with narrow black glands, sparsely punctate otherwise with minute black glands; corolla 4 mm. long; petals united shallowly at base, lanceolate, obtuse, glabrous on outer surface, papillate within, conspicuously black punctate marginally with mostly lineate glands, the medial area nearly glandless; stamens 2.5–2.8 mm. long, attached dorsally to petals; filaments about 0.8 mm. long, wide, borne at apex of the short corolla tube; anthers thick, broadly ovate-elliptic, about 2 mm. long, apiculate, epunctate; ovary in staminate flowers abortive, glabrous; stigma sessile, conical, about 0.4 mm. long, abortive.

Costa Rica: Prov. Alajuela, south side of Volcan Poas, upper slopes, on road leading past weather station, March 24, 1972, *D. E. Stone 3141* (LL, type), small trees 10–20 ft. tall, leaves clustered at ends of shoots, flowers borne on short shoots.

Pistillate flowers were collected on Volcan Poas, subalpine meadow with tussocks of *Hypericum*, ca. 3.5 mi. W of Poasito, alt. ca. 7000 ft., July 13, 1962, *Grady L. Webster, et al. 12258* (LL), tree, 5 m. high, fls. greenish-pink. The pistillate flowers are one-fourth smaller than the staminate, orange rather than black punctate. Borne at apices of the thick lateral spurs, the pedicels are short and thick; the sepals are ovate and about 1.2 mm. long; the corolla measures 3 mm. long with petals united at base and lanceolate with papillate margin and inner surface; the stamens are abortive with short filaments and attached within the petals; the ovary is ovoid, glabrous, smooth, and with a sessile stigma; the stigma is capitate, globose, 0.6–0.8 mm. long, with obscure short obtuse lobes, appearing papillose; and the ovules are uniseriate, 5 in each placenta.

The species has been confused with *R. guianensis* Aubl.

Rapanea mexicana Lundell, sp. nov. — Arbor parva; ramuli glabri; folia glabra, subsessilia vel late petiolata, petiolo ad 6 mm. longo, marginato; lamina chartacea, anguste elliptica vel oblanceolato-elliptica, ad 8 cm. longa, 3 cm. lata, apice acutiuscula vel obtusiuscula, basi revoluta,

acuta, integra; flores 5-meri, fasciculati; pedicelli fructiferi crassiusculi, 1–2.7 mm. longi; sepala late ovata vel rotundato-ovata, ca. 1 mm. longa, subintegra, parce punctata; fructus globosus, ca. 5 mm. diam.

Tree, 9 m. tall, entirely glabrous, the branchlets rather slender, mostly short, with the leaves aggregated at the apex; leaves glabrous, paler beneath, subsessile, the broadly marginate petioles up to 6 mm. long; leaf blades firm, chartaceous, narrowly elliptic or oblanceolate-elliptic, 5–8 cm. long, 1.5–3 cm. wide, the apex broad and acutish or obtusish, base acute, revolute, decurrent to base of petiole, the margin entire, the midvein elevated beneath, nearly plane above, the primary latral vein inconspicuous; flowers 5-parted, fasciculate on short bracteate lateral spurs; pedicels in fruit stout, 1–2.7 mm. long; calyx rather thin, the lobes broadly ovate or rounded-ovate, mostly 1 mm. long, apex obtuse, subentire, sparsely punctate with pallid inconspicuous glands, the medial lineate; fruits globose when ripe, about 5 mm. in diam., apiculate.

Mexico: Chiapas, Pico de Loro, near Escuintla, in advanced forest, June 25, 1941, *Eizi Matuda 4228* (LL, type), tree 9 m. high.

In 1941 I indicated the probable relationship of the taxon to *R. pellucido-punctata* (Oerst.) Mez of Costa Rica, but did not describe the species for I hoped that flowering material would be collected. Thirty five years have passed. I describe the species as *R. mexicana*, the type being the 1941 fruiting collection, for no other material of the taxon has been collected to my knowledge.

Rapanea Pittieri Mez, Pflanzenreich IV. 236: 378. 1902.

Panama: Prov. Chiriqui, E side of Volcan Baru, Ericaceae-dominated elfin forest from ca. 3000 m. to just below the summit, July 24, 1975, *S. Mori & A. Bolton 7432* (LL), shrub, 3 m. tall, fruits purple.

Flowering material is needed to determine if the Panama taxon is distinct. Its leaves differ in some aspects although small and rigidly coriaceous as in the Costa Rican collections of *R. Pittieri*.

Rapanea reflexiflora Lundell, sp. nov. – Arbor glabra; ramuli crassiusculi; folia glabra, punctata, longe petiolata, petiolo 1–1.8 cm. longo, canaliculato; lamina coriacea, oblanceolata vel elliptico-oblanceolata, 6.5–13.5 cm. longa, 3–4.5 cm. lata, apice rotundata vel late obtuso-rotundata, basi acuminata, revoluta, subenervia; flores pistillati fasciculati, axillares vel laterales; pedicelli crassi, 1.6–2 mm. longi, parce punctati; flores 5-meri, glabri; calyx ca. 1 mm.; sepala triangulari-ovata, 0.6–0.8 mm. longa, acuta, erosa, punctata; corolla 2.2–2.5 mm. longa; petala basi coalita, anguste lanceolata, obtusa, reflexa, punctata, intus papillata; stamina abortiva; ovarium subcylindricum, parce punctatum, apice truncatum; stigma sessilis, subconica, ad 1.5 mm. longa, laminiformis; ovula 3, uniseriata.

Tree, to 8 m. tall, the terminal branchlets thick, the lateral slender, glabrous; leaf buds with laciniate margin, glabrous; leaves glabrous, punctate, the petioles up to 1.8 cm. long, rather stout, canaliculate; leaf blades coriaceous, oblanceolate or elliptic-oblanceolate, 6.5–13.5 cm. long, 3–4.5 cm. wide, apex rounded or broadly obtuse-rounded, narrowed to the acuminate base, base revolute, decurrent on petiole, the costa promi-

nent beneath, shallowly impressed above, the veins rather obscure; pistillate flowers fasciculate in the leaf axils or on old wood; pedicels thick, 1.6–2 mm. long, punctate with a few scattered glands; flowers 5-parted, glabrous; calyx about 1 mm. long, punctate with scattered rather large black glands; sepals deltoid-ovate, 0.6–0.8 mm. long, acute, erose-margined; corolla 2.2–2.5 mm. long; petals united at base about one-fourth their length, narrowly lanceolate, with broad open rounded sinus between each at top of tube, obtuse, coarsely and densely punctate with red-black glands, papillate within, sharply reflexed; stamens abortive, attached at apex of the corolla tube, borne within the petals; anthers abortive, narrowly lanceolate, acuminate; ovary subcylindrical, truncate at apex, punctate with scattered glands; stigma sessile, narrowly conical, up to 1.5 mm. long when dry, vertically and irregularly laminated; ovules 3.

Panama: Prov. Cocle, woods adjacent to chicken farm, La Mesa, above El Valle, Jan. 3, 1974, *John D. Dwyer 11885* (LL, type), tree to 25 ft. tall, flower buds yellow.

The large leaves with long petioles, the narrow petals with broad sinuses between and sharply reflexed, the elongated subcylindrical ovary, and the conical laminated style are among the distinguishing features of *R. reflexiflora*. The taxon has leaf buds with laciniate margin and the petals are papillate within, a remarkably glabrous plant.

Rapanea rufa Lundell, sp. nov. — Arbor parva; ramuli novelli rufo-villoso-tomentosi; folia longe petiolata, petiolo 1–1.5 cm. longo, rufo-villoso; lamina membranacea, glabrata, oblongo-oblanceolata, 5.5–12 cm. longa, 1.7–3.7 cm. lata, apice obtusa vel acutiuscula, basi acuminata, integra; flores 5-meri, fasciculati, glabri, subsessiles; sepala subcarinata, ovata vel triangulari-ovata, ca. 1 mm. longa, obtusiuscula vel acuta, glanduloso-ciliolata, epunctata vel parce punctata; corolla 3 mm. longa; petala parce punctata, basi connata ca. 1.3 mm., lanceolata, apice papillata; stamina sessilis; antherae ca. 1.8 mm. longae; ovarium glabrum, subglobosum; ovula 3.

Tree, the branchlets rather slender, rufous-villous-tomentose apically; leaves with slender villous petioles up to 1.5 cm. long; leaf blades punctate, villous at base and along midvein at first, glabrate, thin, membranaceous, oblong-oblanceolate, up to 12 cm. long, 3.7 cm. wide, the apex obtuse or acutish, base acuminate, the margin entire, the midveins elevated beneath, slightly so and villous above, the veins inconspicuous and rather obscurely and openly reticulate; flowers 5-parted, glabrous, fasciculate on short lateral spurs, the latter with appressed fimbriate scales; pedicels thick and very short, less than 1 mm. long; calyx about 1.5 mm. long, the sepals ovate or triangular-ovate, about 1 mm. long, obtusish or acute, glandular-ciliolate, sparsely punctate with dark red glands, some sepals eglandular, others with 1 to 6 rounded or oblongish glands; corolla (dry) 3 mm. long, glabrous; petals united almost to middle, lanceolate, apex papillate, acutish, punctate with reddish glands, stamens sessile at top of corolla tube; anthers about 1.8 mm. long, attached dorsally to petals, apparently abortive; ovary glabrous, subglobose; stigma sessile, 1 mm. long, with thin irregular flabellate lobes, broadest at base; ovules 3, imbedded in the placenta.

Costa Rica: Prov. San Jose, Cordillera de Talamanca, Pacific slope of the Chirripo massif, elev. 2700–3000 m., oak forest with *Chusquea* understory, April 6, 1969, *Gerrit Davidse & Richard W. Pohl 1635* (LL, type), slender tree, 10 cm. dbh.

The thin large leaves on long petioles, red villous-tomentose indument, glabrous pistillate flowers with sepals epunctate or sparsely punctate, and the thin flabellate-lobed stigma are distinguishing features of the taxon.

ETHNOBOTANICAL NOTES FROM GUATEMALA

CYRUS LONGWORTH LUNDELL

Fig. 38. The vessels made from the hard shells of *Crescentia Cujete* L. fruits are called *luchs* by the Maya of La Libertad, Peten, *huacal* by the Spanish (fide Mercedes Aguilar H. of La Libertad in 1933). Often the cups and bowls are incised with attractive designs. They have been used by the Maya since ancient times for many purposes.

Fig. 39. *Crescentia Cujete* L. growing in the savanna country of central Peten. Note the large round fruits hanging from the main branches of the tree.

THALICTRUM HENRICKSONII (RANUNCULACEAE), NEW SPECIES FROM THE CHIHUAHUAN DESERT REGION

MARSHALL C. JOHNSTON[1]

Thalictrum Henricksonii M. C. Johnst., sp. nov. – Aff. *T. grandifolium* Watson et *T. parvifructum* Boivin, differt fructibus ca. 3 mm. longis, rugis paucis transversalibus prominentibus, rugulis irregularibus.

Perennial herbs to 1 m. high; stems stramineous, ribbed, puberulent with capitate hairs to 0.1 mm. long and wide; leaflets orbicular, 15–30 mm. long and wide, 3-lobed in the distal half, the lobes in turn more shallowly 2–3-lobed or unlobed, entire, obtuse, somewhat apiculate and white glandular above at the apex, the leaflets cordate to more or less rounded at the base, glabrous throughout, dark green above, lighter gray-green below; petiolules and rachis angled, yellowish, capitate-pubescent; petioles canaliculate, dilated at the base, the flaring scarious-membranous margins to 15 mm. long, 1 mm. broad, auriculate distally; inflorescence terminal, paniculate, 2–15 mm. long; pedicels 5–12 mm. long, erect to horizontal, recurved near the tip, sparsely stipitate glandular; receptacle globose, 0.5–0.7 mm. broad; some flowers perfect, some unisexual on same plant; sepals 4, ovate, 2–2.5 mm. long, 3–6-nerved from the base, scarious, fugaceous; stamens 10–20?, anthers linear, 2.5–3 mm. long, the apiculate tip 0.3 mm. long, filaments 2–3 mm. long, filiform, slightly enlarging distally; ovaries 5–6, styles 3–4 mm. long at anthesis, fugaceous, leaving a short base 0.1–0.4 mm. long; mature fruits obliquely ovoid, obtuse to rounded at the base, obtuse at the apex, convex at upper and lower margin, lateral nerves sinuous, irregularly anastomosing becoming prominently and irregularly ruminate-rugose, the intercostal areas also rugose, grayish green, glabrous, coriaceous, the pericarp 0.3 mm. thick; seeds subglobose, 2.2 mm. long, seed coat thin, striate-pustulate.

Mexico: Zacatecas: 16 (airline) miles (24 km.) northeast of Estacion Camacho on the northwestern slopes of Pico de Teyra, in rocky granite openings bordered by *Aloysia, Fouquieria, Mimosa, Dalea, Yucca, Ipomoea, Sicyos, Perezia* etc., 6800 ft., (2050 m.), 24° 33′ North latitude, *James Henrickson 13417* (LL, holotype; RSA, MEXU, isotypes).

The new species belongs to the section *Camptogastrum* Boivin of the subgenus *Lecoyerium* Boivin and appears most similar to *T. parvifructum* Boivin of the subsection *Gibbosa* Boivin, of the Sierra Madre Occidental, but it is a slightly larger plant with only stipitate capitate hairs (not with pilose hairs as well) and the mature fruit nerves are prominently and irregularly ruminate-rugose not more or less smooth as in *T. parvifructum*. The new species is vegetatively very similar to *T. grandifolium* Wats., widespread in northern Mexico, but is smaller in floral features, and again lacks the pilose hairs characteristic of that species and in its distinctive mature-fruit markings.

This represents work on the *Chihuahuan Desert Flora* supported in part by National Science Foundation grant BMS73-00898 A02, acknowledged with gratitude.

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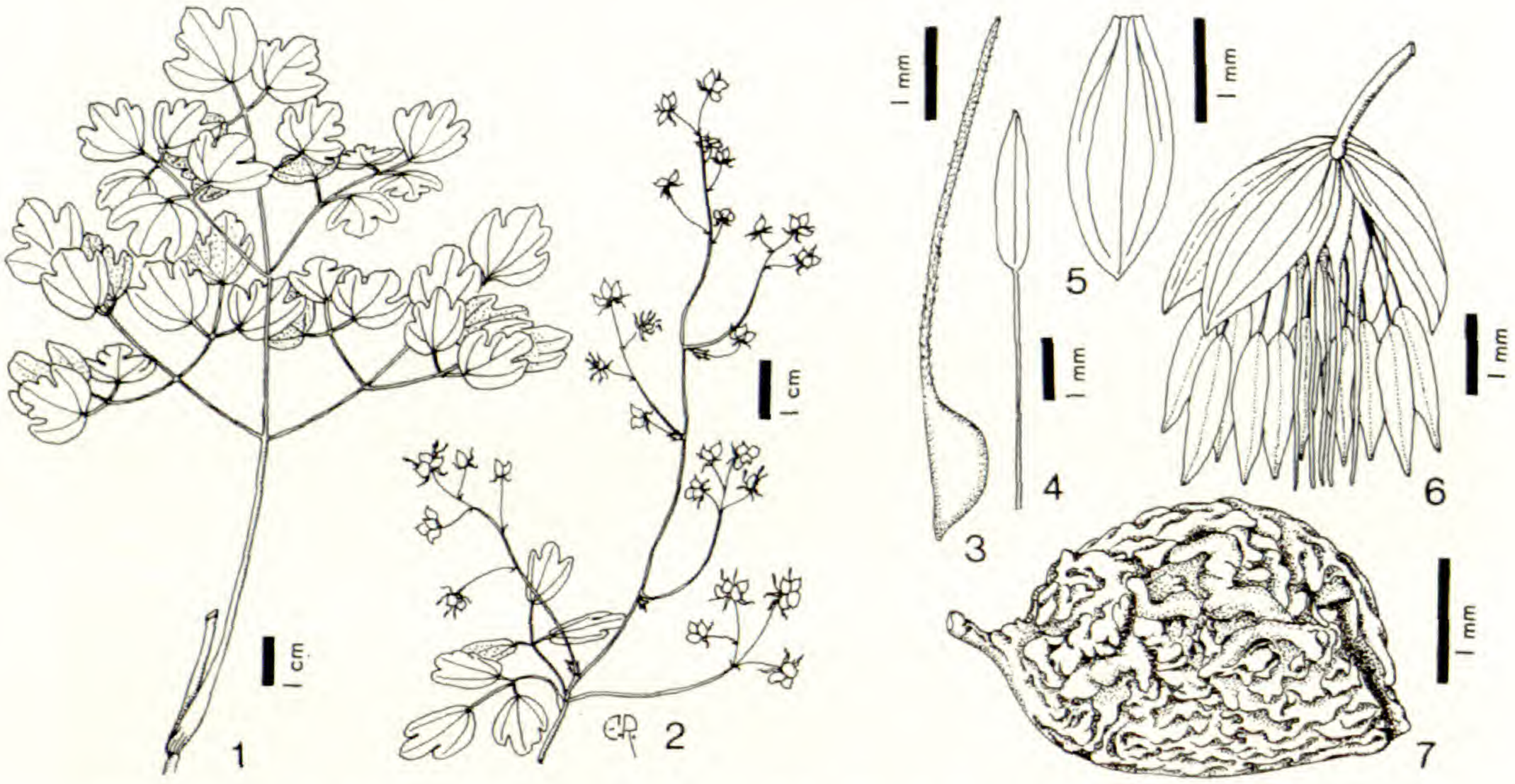

Fig. 40. *Thalictrum Henricksonii* M. C. Johnston: 1. triternate leaf; 2. inflorescence; 3. pistil; 4. stamen; 5. sepal; 6. flower, with certain stamens removed to show pistils; 7. mature achene showing convoluted sculpturing. Delineation by Frances Runyan.

NEW SPECIES AND COMBINATIONS IN SABAZIA (HELIANTHEAE, GALINSOGINAE)[1]

B. L. TURNER[2]

In spite of a recent monographic study of the genus (Longpre, 1970) and yet further additions and emendations (Urbatsch and Turner, 1975), *Sabazia* continues to yield undescribed taxa, especially from the poorly known mountainous regions of southern Mexico. The species described below are quite distinct and would key to *Sabazia* in the generic key of Urbatsch and Turner. Achene characters of the two taxa do weaken, somewhat, the distinction of *Oteiza* from *Sabazia*, for both *S. Breedlovei* and *S. brevilingulata* possess a pappus of several (6–10), caducous, setiform, fimbrillate scales, a character which has, in part, been used to distinguish *Oteiza* from both *Calea* and *Sabazia* (Urbatsch and Turner, 1975). Nearly all of the other features, however, are characteristic of the genus in which they are placed. The two species, especially *S. brevilingulata*, are most closely related to the Oaxacan species, *S. trifida* Fay (1973).

The latter species has been transferred to the closely related, recently expanded, genus *Galinsoga* by Canne (1976). I can not agree with her disposition of *S. trifida* except as how she expands the genus to include

[1]Support was received, in part, from Grant 1013950 from the National Science Foundation. I thank M. C. Johnston for composing the Latin descriptions and D. E. Breedlove for calling to my attention the plants concerned.

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those annual taxa described here and perhaps yet others from South America. Alternatively I might be equally justified in treating all of her section *Elata* within *Sabazia*, this being as comfortably situated there as in *Galinsoga* or, indeed, both genera might be included together as noted by Canne (1977, in press), although I do not accept her premise that "These taxa [section *Elata*] are clearly, on morphological grounds, most closely related to *Galinsoga* . . ." Clearly, these several genera are in need of much additional study especially bringing to bear new taxonomic criteria such as flavonoid and allozyme data.

Sabazia Breedlovei Turner, sp. nov. — Herbae annuae capitulis globosis; involucrum 4–5-seriatum seriebus maxime inaqualibus; receptaculum hemisphaericum paleis bene evolutis albis scariosis 2–3-dentatis; ligulae albae 3-lobatae; achaenia uniformia clavata glabra, squamae pappi 8–10 facile deciduae anguste lineares fimbriatae.

Annual (?) herb with mostly glabrate, rather stiffly ascending stems; leaves opposite, occasionally alternate, petiolate, the blades broadly ovate to rhomboid, serrate, sparsely pubescent with long crisp hairs; heads globose, ca. 10 mm. across (excluding the ray florets), borne in a loose cyme, the peduncles 30–60 mm. long, densely pubescent with crisp spreading hairs; involucre scarious, 4–5-seriate, strongly gradate, the outermost bracts rounded at the apex, 2–3 mm. long, the innermost variously obtuse, 5–6 mm. long; receptacle hemispheric, 5–6 mm. wide, 3–4 mm. high, minutely pubescent and covered with a well-developed, delicate, white, scarious, 2–3 dentate, readily dehiscent chaff, the larger pales alternating with linear-lanceolate, fimbrillate scales; ray florets ca. 13, pistillate, fertile; ligules white, 7–9-nerved, 3-lobed, ca. 15 mm. long. 5 mm. wide; tube ca. 5 mm. long, densely pubescent with straight, uniseriate trichomes; disk florets numerous, perfect, fertile; corolla prominently nerved, ca. 4 mm. long, 5-lobed, pubescent throughout, especially on the tube; limb ca. 2 mm. long, ampliate, the lobes acute; style branches relatively thick, flattened, recurved, ca. 1 mm. long with well-defined stigmatic lines and a short, obtuse, somewhat swollen, pappilose appendage; achenes of the ray and disk similar, clavate (rhomboid in cross-section near the apex), black, glabrous, surmounted by a pappus of 8–10 fragile, easily deciduous, narrowly linear, fimbrillate scales.

Holotype (DS): Mexico: Chiapas, Municipio of Motozintla de Mendoza, 45–50 km. NE of Huixtla along road to Motozintla, steep slopes with Montane Rain Forest associated with *Oecopetalum*, *Magnolia*, *Wimmeria* and *Podocarpus*, 1900 meters, November 17, 1971, *D. E. Breedlove & A. R. Smith 22632* (LL, isotype).

Known only from the type collection and named for the foremost student and collector of the area concerned, Dr. Dennis E. Breedlove. The species is remarkable for its large, spherical heads with zinnioid involucre and must rank as one of the most attractive species of the genus. If taken into cultivation it should make an outstanding garden ornamental. Unfortunately, its root is not known but from its general habit it appears to be an annual.

Sabazia brevilingulata Turner, sp. nov. – Herbae annuae erectae 20–40 cm. altae; receptaculum late conicum paleis paucis plerumque anguste linearibus fimbriatis prompte deciduis; ligulae ca. 13, subroseoalbae inconspicuae vix bracteas superantes; achaenia subuniformia, squamae pappi 6–8 fragiles facile deciduae fimbriatae.

Annual, sparsely branched, erect herb, 20–40 cm. tall; leaves opposite, petiolate, the blades ovate, serrate, densely pubescent with long crisp hairs; heads hemispheric, 5–7 mm. across, borne in few-headed cymes, the peduncles 30–50 mm. long, pubescent with crisp spreading hairs; involucre scarious, 3–4-seriate, somewhat gradate, the outermost bracts acute or obtuse at the apex, ca. 3 mm. long, the innermost variously acute, ca. 6 mm. long; receptacle broadly conical, ca. 2.5 mm. across, 3 mm. high, minutely pubescent, the pales few (seemingly absent except in careful dissection), mostly narrowly linear and fimbrillate, ca. 2 mm. long, readily deciduous; ray florets ca. 13, pistillate, fertile; ligules pinkish-white, inconspicuous, scarcely exceeding the subtending bracts; tube sparsely pubescent with straight uniseriate trichomes; disk florets ca. 40, perfect, fertile; corolla ca. 2.8 mm. long, 5-lobed; limb glabrous, narrowly ampliate, ca. 0.8 mm. long; tube ca. 2 mm. long, densely pubescent; style similar to *S. Breedlovei*, but smaller; achenes of the ray and disk narrowly clavate, brownish-black, glabrate, ca. 2 mm. long, surmounted by a pappus of 6–8 fragile, easily deciduous, narrowly-linear, fimbrillate scales, ca. 1.8 mm. long.

Holotype (DS): Mexico: Chiapas, Municipio of Motozintla de Mendoza, on the north and west slope of Cerro Mozotal between the microwave tower along the road from Huixtla to El Porvenior and Siltepec, steep slopes in Evergreen Cloud Forest associated with *Quercus, Pinus, Abies, Drimys, Photinia, Clethra, Cornus* and *Symplocos*, 3000 meters, November 18, 1971, *D. E. Breedlove & A. R. Smith 22718* (LL, isotype).

The species is undoubtedly related to *S. Breedlovei*, but is readily distinguished by its *Simsia*-like heads, minute ligules and "seemingly chaffless" receptacle; it is probably closest to *S. trifida*, as already noted, but can be readily distinguished from that species by its short ligule and peculiar chaff.

Sabazia annua (Blake) Turner, comb. nov. – *Alepidocline annua* Blake, J. Wash. Acad. Sci. 34: 441. 1934.

Blake took his monotypic genus *Alepidocline* to be related to *Schistocarpha*, tribe *Neurolaeneae* (Rydb., 1934), accurately noting the clear distinctions between the taxa, especially the marked differences in achene shape. Actually, *Alepidocline* is much closer to *Sabazia* of the *Galinsoginae;* in fact, nearly all of its features are like those of *Sabazia brevilingulata* and I have no hesitation in placing it next to this species.

Sabazia annua, S. brevilingulata and *S. Breedlovei*, all erect annuals with multiseriate scarious involucral bracts, seemingly make up a natural element in this imperfectly known genus. All these are probably most closely related to *S. microspermoides* Longpre, which Longpre (1970) notes as having "no obvious close relationship to any other species" of *Sabazia*. Of course, the several taxa discussed here were unknown to him

at the time of his treatment. As indicated below, much additional work is needed on the South American taxa (probably disguised in several genera) before the genus can be properly comprehended.

Sabazia Sodiroi (Heiron.) Turner, comb. nov. — *Calea Sodiroi* Heiron., Engl. Bot. Jahrb. 29:51. 1900.

Heironymous correctly notes that this Ecuadorian species is related to *Calea caracasana* (Kunth) Heiron. but differs in its sessile leaves and involucral bracts among other characters. Urbatsch and Turner (1975) were the first to suggest a relationship with *Sabazia*. Having now studied the taxa in more detail, the present transfer seems appropriate.

The similarity of *S. Sodiroi* to *Calea caracasana* is more superficial than real. The two are quite different in their corolla structure, size of staminal tube, shape and size of style branches and in their achenes. Combined with its short, 3-lobed receptacular scales, there can be little doubt as to the generic position of the former, where the species would seem to fit comfortably near the sessile-leafed, Colombian species, *S. Trianae* (Heiron.) Longpre.

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A NEW GYPSOPHILOUS SPECIES OF GAILLARDIA (COMPOSITAE) FROM COAHUILA, MEXICO

B. L. TURNER[1]

Collections from the Chihuahuan Desert Region of north-central Mexico by Dr. M. C. Johnston and collaborators continue to yield new taxa of Compositae, some of the more notable being restricted to gypseous soils. Such is the following *Gaillardia* which ranks, along with *G. gypsophila* Turner and *G. Powellii* Turner (Southwestern Naturalist 17:181–190. 1972), as one of the, geographically, more restricted species of that genus.

Gaillardia Henricksonii B. L. Turner, sp. nov. — Herbae perennes caulibus tomentosis; folia linearia vel anguste oblanceolata 2–3(–4) mm. lata 30–50 mm. longa albotomentosa; pedunculi albotomentosi 1.5–3.5 cm. longi; receptaculum globosum ca. 2 mm. diametro setis congestis brevibus ad 0.5 mm. longis; flores radiati 8 steriles ligulis salmoneo-aurantiacis 10–12 mm. longis ca. 6 mm. latis 3-lobatis; stylus ca. 6 mm. longus ramis ca. 3 mm. longis, basi lineis stigmaticis ca. 1.5 mm. longis

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apice appendicibus purpureis penicillatis; pappus paleis 8 erosis unaquaequae parte basali lanceolata ca. 3 mm. longa parte apicali tenui aristiformia barbellata ca. 3 mm. longa.

Perennial herbs 10–20 cm. tall from a well-developed, woody taproot; stems leafy throughout, short, stout, ascending, white-tomentose; leaves linear to narrowly oblanceolate, 2–3(–4) mm. wide, 30–50 mm. long, white-tomentulose, entire or very rarely with a few short lobes, 1–2 mm. long; peduncles white-tomentose, 1.5–3.5 cm. long; involucre broadly hemispheric, 1.0–1.5 cm. across, about 0.8 cm. high; bracts tomentulose, in 2–3(–4) series, narrowly ovate-lanceolate, 6–9 mm. long, 2–3 mm. wide; receptacle globose, ca. 2 mm. across, covered with short bristles 0.5 mm. long or less; ray-florets 8, sterile; ligules salmon-orange ("dull red" according to holotype data), 10–12 mm. long, ca. 6 mm. wide, 3-lobed (rarely 4–5-lobed, the extra lobes at base of ligule), lobes 2–3 mm. long, 1–2 mm. wide; disk-florets 60–80, the corollas ca. 6 mm. long, mostly yellow below, but collectively (i.e. heads) rusty-brownish-purple, the tube short, ca. 1 mm. long, abruptly narrowed into a broadly tubular throat, ca. 5 mm. long, 2.5 mm. wide; lobes short, acute, ca. 1 mm. long, pubescent with short, multicellular, mostly white, trichomes; anthers ca. 5 mm. long, the sacs 4 mm. long with lanceolate appendages; styles ca. 6 mm. long, the branches ca. 3 mm. long with pronounced stigmatic lines for ca. 1.5 mm. at base, the remainder extending into a purplish, penicillate appendage; achenes obpyramidal, 4-sided, ca. 2 mm. long, 1 mm. wide, densely pubescent throughout with elongate, stiff, white hairs, 2.0–3.0 mm. long; pappus scales 8, erose, broadly lanceolate for ca. 3 mm. at base, terminated by a slender barbellate awn ca. 3 mm. long. Chromosome number, $n =$ ca. 17 II.

Holotype (LL): Mexico; Coahuila, 15.2 road-miles N of Villa Ocampo along new road to Guaje, 27°33′ N. latitude, 102°72′ W. longitude, in gypsum outcrop, Sept. 23, 1974, *J. Henrickson 14234*.

Additional collections examined: Coahuila, 17.1 road-miles N of Villa Ocampo, *Henrickson & Prigge 15217* (LL); 17.1 road-miles No of Villa Ocampo, *Henrickson & Prigge 15223* (LL).

It is a pleasure to name this striking new gypsophile for Dr. James Henrickson, an exceptionally active field collector in the Chihuahua Desert and very observant scholar of the Compositae generally.

Gaillardia Henricksonii is undoubtedly most closely related to *G. Powellii*, which is known only from the vicinity of Estacion Hermanas, Coahuila, about 150 km. southeast of Villa Ocampo. The latter species can be readily distinguished by its much broader (0.4–1.4 cm. wide), merely setose leaves, more elongate peduncles (6–16 cm. long), rays with longer teeth and less pubescent achenes with more numerous (10–12) pappus-scales, etc. That they are closely related may be readily ascertained by their very similar style-branches and receptacles, characters which have proved quite useful in grouping taxa within the genus.

I am grateful to Dr. Marshall C. Johnston for the Latin description, and to Dr. Henrickson for calling my attention to the collections and for his help in procuring the excellent delineation (fig. 41) by Frances Runyan. Supported in part by a National Science Foundation Grant.

Fig. 41. *Gaillardia Henricksonii* B. L. Turner: 1. growth habit; 2. flowering capitulum; 3. mature achene with biseriate basal trichomes and pappus; 4. ray floret with abortive achene (pappus partially removed); 5. disk floret, note two reduced receptacular bracts at base (pappus partially removed); 6. pappus from disk floret; 7. staminal column, cut to show outer surface; 8. style showing paired stigmatic lines and elaborate stylar appendages; 9. disk floret corolla lobe with uniseriate hairs. Delineation by Frances Runyan.

INFRASPECIFIC CATEGORIES OF MACHAERANTHERA PINNATIFIDA (COMPOSITAE)

B. L. Turner and R. Hartman[1]

Hartman (1976) recently completed a monograph of the section *Blepharodon* of *Haplopappus* as circumscribed by Hall (1928). Following Shinners (1950), Correll and Johnston (1970) and yet others, he treated the section as belonging to the wholly North American genus *Machaeranthera* instead of *Haplopappus*, a polyphyletic assemblage typified by South American elements seemingly only remotely related to the North American elements.

One of the most variable and widespread species of this group is *Machaeranthera pinnatifida* (Hook.) Shinners which occurs from Canada to central Mexico. It is an abundant perennial herb, especially in waste places and along road shoulders. It appears that the latter habitats, in particular, have promoted much infraspecific geographic mixing, thus complicating populational structure.

Although the junior author (1976) treated the entire "*Machaeranthera pinnatifida* complex" as a single species without infraspecific categories, nevertheless, it is apparent from both herbarium sheets and extensive field work that regional variations in the complex can be recognized, albeit with difficulty, especially in regions of intergradation or where hybridization among populational forms appears to occur.

The abundant material of this species, on loan from numerous institutions, has been the subject of further study, and the present authors feel emboldened to suggest the following account of infraspecific taxa which might prove beneficial to those persons seeking a portrayal of regional variation in the taxon. Since a number of infraspecific categories have already been published, and since we have examined type material of all the names proposed, it seems reasonable and expedient to have this information placed on record for those persons interested in taking up such names. In addition, this abbreviated overview can serve as a guide for any future worker ambitious enough to take on *Machaeranthera pinnatifida* as a thesis problem.

As already noted, *Machaeranthera pinnatifida* is an exceedingly complex, variable taxon. It is doubtful that any "absolute" key can be constructed so as to recognize unequivocally the infraspecific categories proposed here. Instead, we have composed a key that attempts to recognize character *trends*, in combination, that serve to distinguish a given taxon from another, but the occasional (if not frequent) specimen will be found that keys to a given regional variety but belongs to yet another. However, if one accepts the exception and recognizes our account as an attempt to portray quite variable, *regional populations* and not as a key to individuals, then little trouble should be experienced in pinning a varietal name on this or that collection.

In the treatment that follows we have recognized about the same number of infraspecific taxa as did Hall (1928) in his treatment (7 versus 8, respectively). However, we have examined at least 100-fold the number

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of specimens available to him and of course we rely upon more extensive field work than he was able to undertake at the time of his study, consequently we believe that we have a better "feel" of the species-complex than he had. Still, we do recognize 5 of the infraspecific taxa which he recognized, i.e. varieties *pinnatifida, glaberrima, chihuahuana* (= subsp. *australe), Gooddingii* and *scabrella;* and we believe that he would have also recognized our varieties *paradoxa* and *incisifolia* (as subspecies) had sufficient material been available to him. Our major contribution to the taxonomy of the group then, has been to provide correct nomenclature for its treatment in *Machaeranthera* and delineating better, both morphologically and geographically, the taxa concerned.

Key to Infraspecific Categories of *Machaeranthera pinnatifida*

1. Heads large (pressed involucres 15–25 mm. across), mostly solitary on elongate peduncles (grading into short peduncles in S. Baja California); shrublets with stiffly ascending branches, mostly 50–100 cm. tall; foliage relatively sparse, crowded below, internodes at mid-stem relatively long (quite short in S. Baja California). Plants of Western Colorado, Utah, Nevada, Arizona, California and Baja California, Mexico ..... 2. subsp. *Gooddingii*
   2. Heads borne on elongate, leafy "peduncles", the leaves being progressively much-reduced and subspinose; plants decidedly sub-shrubby, up to 100 cm. tall ..... 2a. var. *Gooddingii*
   2. Heads borne on relatively short, leafy "peduncles", the upper leaves not much reduced or subspinose; perennial herbs, but often woody below or at the crown, mostly 30–60 cm. tall.
      3. Heads broadly campanulate; perennial herbs with relatively short stems and large pinnatisect leaves (western Colorado, adjacent Utah and Arizona) ..... 2b. var. *paradoxa*
      3. Heads broadly turbinate to campanulate; perennial herbs with elongate, ascending, stems and smaller, dentate to merely incised, leaves (Baja California).
         4. Heads large, pressed involucres 22–25 mm. wide; leaves large and decidely incised; local insular species of Baja California ..... 2d. var. *incisifolia*
         4. Heads smaller, pressed involucres 15–20 mm. wide; leaves small and merely spinose or dentate; wide-spread species of southern Baja California ..... 2c. var. *scabrella*
1. Heads smaller (pressed involucres 8–15 mm. across), mostly 2-several per stem on relatively short terminal and lateral peduncles; plants low, stiffly ascending to sprawling, mostly 50 cm. tall or less; foliage abundant and not much reduced upwards, the internodes at mid-stem relatively short (1 cm. or less long) ..... 1. subsp. *pinnatifida*
   5. Stems stiffly erect, mostly unbranched, the foliage glabrate or nearly so; heads nearly sessile; pappus profuse, pronounced in the head, straw-colored, exceeding the corollas; central states, S. Dakota to northern Texas ..... 1b. var. *glaberrima*
   5. Stems sprawling and usually much-branched, rarely stiffly erect, the foliage variously pubescent and/or glandular, rarely glabrous; pappus less pronounced in the head, about as long as the corolla; widespread variable species, mostly western from Canada to central Mexico.
      6. Heads, when pressed and dried, mostly 8–12 mm. wide; stems equally leafy throughout; plants mostly low, 10–40 cm. tall; only rarely stiffly erect or woody at the base. Wide-spread ..... 1a. var. *pinnatifida*
      6. Heads, when pressed and dried, mostly 12–16 mm. wide; stems mostly leafy below, the upper leaves much reduced giving the heads a "long-peduncled" appearance; plants stiffly erect and often woody below

mostly 30–50 cm. tall. Chihuahuan and Sonoran deserts of southern Arizona, southern New Mexico, Trans-Pecos Texas and northern Mexico ..... 1c. var. *chihuahuana*

1. **Machaeranthera pinnatifida** (Hook.) Shinners, Sida 1: 295. 1964, subsp. **pinnatifida.**

1a. **M. pinnatifida** (Hook.) Shinners var. *pinnatifida.*

Sideranthus pinnatifidus Nutt., 1813, (not validly published).
Amellus spinulosus Pursh, 1814, not *Machaeranthera spinulosa* Greene, 1899.
Starkea pinnata Nutt., 1818, based on the above.
Sideranthus spinulosus (Pursh) Sweet, 1826, (not validly published).
Diplopappus pinnatifidus Hook., 1834.
Haplopappus spinulosus (Pursh) DC., 1836.
Dieteria spinulosa (Pursh) Nutt., 1840.
Haplopappus spinulosus var. *canescens* A. Gray, 1849.
Haplopappus Coulteri Harv. & A. Gray, 1849.
Haplopappus spinulosus var. *glaber* A. Gray, 1852.
Aster pinnatifidus (Hook.) O. Kuntze, 1891.
Eriocarpum spinulosum (Pursh) Greene, 1894.
Eriocarpum Wootonii Greene, 1898.
Sideranthus australis (Greene) Rydb., 1900.
Sideranthus spinulosus (Pursh) Sweet ex Rydb., 1900.
Sideranthus puberulus Rydb., 1900.
Sideranthus tubinellus Rydb., 1900.
Sideranthus machaeranthera Small, 1903.
Sideranthus cotula Small, 1903.
Sideranthus Wootonii (Greene) Standl., 1910.
Sideranthus laevis Wooton & Standl., 1913.
Haplopappus spinulosus var. *turbinellus* (Rydb.) Blake, 1917.
Haplopappus spinulosus subsp. *cotula* (Small) Hall, 1928.
Haplopappus spinulosus subsp. *laevis* (Wooton & Standl.) Hall, 1928.
Machaeranthera laevis (Wooton & Standl.) Shinners, 1950.
Machaeranthera pinnata (Nutt.) Shinners, 1950.
Haplopappus texensis R. C. Jackson, 1962.
Machaeranthera texensis (R. C. Jackson) Shinners, 1964.

As indicated in fig. 42, this is the most widespread variety of *Machaeranthera pinnatifida*, the type locality being near Jasper Lake, Canada. Populations in this region are composed of relatively low, pubescent plants with small heads. Similar populations extend southward into and along the front of the Rocky Mountains to just across the Mexican-United States border. In Colorado, New Mexico and Texas these typically pubescent populations are gradually replaced with populations containing variously pubescent or partially glabrous individuals including some

which are glandular-pubescent only. As one proceeds into Mexico and western Texas the latter forms begin to predominate and, what with the appearance of larger heads and more basal leaves, pass into the var. *chihuahuana*. In eastern Wyoming, eastern Colorado, eastern New Mexico and the panhandle of Texas the more typical, mostly pubescent, populations pass into the var. *glaberrima*, the two varieties often occuring near one another, but it is believed that this has resulted primarily from migration along road shoulders, in relatively recent time, of var. *pinnatifida* into the regions of var. *glaberrima*, and perhaps vice versa.

As indicated in the synonymy, we consider the several early varieties described by Gray to be no more than forms of the var. *pinnatifida*, the varieties *canescens* and *glaber* being pubescent and partially glabrous individuals, respectively, from populations of New Mexico, while the var. *turbinellus* from Idaho is fairly typical *pinnatifida*.

The subsp. *cotula* is a glandular form with a highly pinnatisect leaf, a not uncommon form which occurs sporadically throughout much of the range of var. *pinnatifida*. Indeed, forms referrable to both subsp. *cotula* and var. *pinnatifida* may be found growing together in north central Texas [e.g., Mitchell Co., *R. W. Pohl 5157;* pubescent and glabrate individuals noted as growing side by side were annotated (SMU) as different subspecies by R. C. Jackson].

The relatively restricted populations in southernmost Texas described by Jackson as *Haplopappus texensis* are superficially very similar to var. *glaberrima* but they are relegated to synonymy under var. *pinnatifida* because they intergrade with the latter taxon in this region. An alternative treatment would be to accord these restricted populations varietal rank under the subspecies *pinnatifida* but there seems insufficient morphological divergence to justify such recognition in spite of their reported reproductive isolation (Jackson, 1964).

1b. **M. pinnatifida** var. **glaberrima** (Rydb.) Turner & Hartman, comb. nov. — *Sideranthus glaberrimus* Rydb., Bull. Torrey Club 27: 621. 1900.
Sideranthus spinulosus var. *glaberrimus* (Rydb.) A. Nels., 1909.
Haplopappus spinulosus var. *glaberrimus* (Rydb.) Blake, 1917.
Haplopappus spinulosus subsp. *glaberrimus* (Rydb.) Hall, 1928.

Populations of this variety seem fairly well-marked throughout most of Kansas and Nebraska and southern South Dakota, but to the western periphery of these regions they intergrade over a broad area into var. *pinnatifida*, especially in Oklahoma and the panhandle region of Texas. As indicated by the synonymy, nearly all workers have recognized the infraspecific validity of the taxon.

1c. **M. pinnatifida** var. **chihuahuana** Turner & Hartman, var. nov. — A var. *pinnatifida* plantis suffruticosis, foliis basi congestioribus, caulibus rigidis adscendentibus, capitulis majoribus paucioribus, pedunculis longioribus differt.

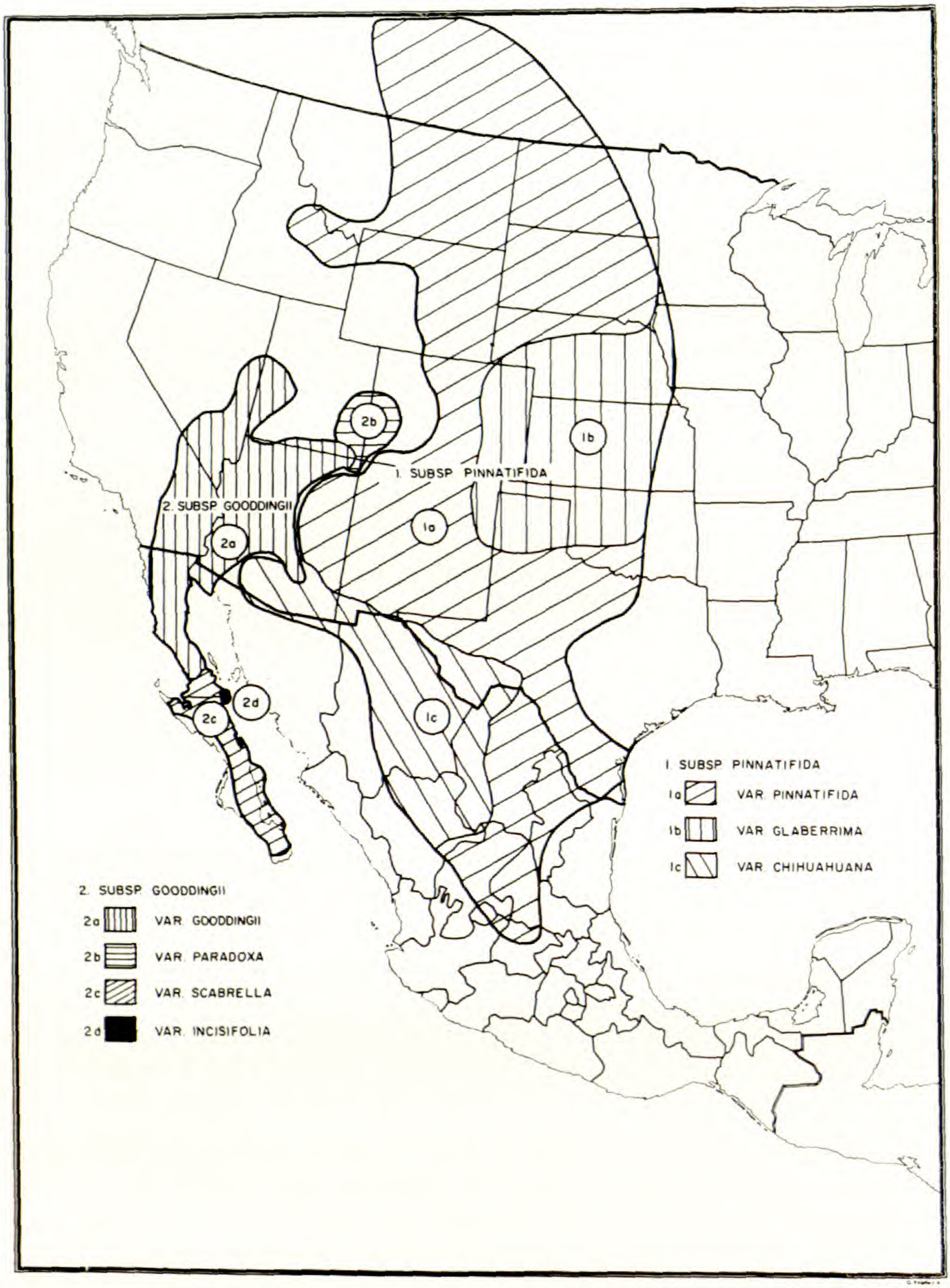

Fig. 42. Approximate distribution of the infraspecific taxa of *Machaeranthera pinnatifida* (Hook.) Shinners. Considerable intergradation occurs in the regions of contact as discussed in the text itself.

Differing from the var. *pinnatifida* in being subshrubby, with stiffly ascending stems, larger, fewer heads, longer peduncles and more basally-clustered leaves.

Holotype (TEX): Mexico: Chihuahua, ca. 16 mi. SE of El Morreon on road to lake on Rio Conchos, Sierra de las Monillas; growing on Jurassic gypsum, July 13, 1972, *A. M. Powell 2447*.

To judge from the description and distribution, this is probably the taxon which Greene (1894) had in mind when he proposed *Eriocarpum australe* [= *Sideranthus australis* (Greene) Rydb., 1900; = *Haplopappus spinulosus* subsp. *australis* (Greene) Hall, 1928; = *Machaeranthera australis* (Greene) Shinners, 1950]. Unfortunately Greene proposed no type nor did he cite specimens examined or specific locales where the plant might occur. Rather than confound the problem of typification we have taken up a new varietal name which characterizes its primary regional habitat type, the Chihuahuan Desert. The holotype is shortly glandular throughout and has a chromosome number of $n = 8$ pairs (A. M. Powell, unpubl.).

The var. *chihuahuana*, as treated here, is an exceedingly variable taxon and no doubt future workers will whittle out from this additional varieties, if not cryptic species. But this will require much additional field and experimental work and it seems best to maintain the group in a mixed bag until more definitive studies are made. So treated, the only other name that falls into synonymy under this taxon is *Sideranthus viridis* Rose & Standl., 1912, typified by material from the Pinacate Mts., Sonora, Mexico. Collections from the Sonoran desert may ultimately prove distinct, in which case, if treated specifically, this name must apply. However, from herbarium material, the Sonoran elements appear to intergrade into the var. *pinnatifida* in northeastern Sonora, much as do the Chihuahuan desert elements in southern New Mexico and adjacent Chihuahua.

In Texas, typical elements of the var. *chihuahuana* occur only in the Big Bend region of trans-Pecos Texas, although to the north, east and west of this area it grades into var. *pinnatifida*. A number of populations of var. *chihuahuana* from in and about north-central Mexico have been examined chromosomally and most have been tetraploid with $n = 8$ II (Powell, unpubl.; Turner, unpubl.) although diploid collections ($n = 4$ II) are known, even from areas relatively near to the type locality (e.g., Brewster Co., Texas; *Turner 7091*, TEX).

2. **Machaeranthera pinnatifida** (Hook.) Shinners subsp. **Gooddingii** (A. Nels.) Turner and Hartman, comb. nov., based upon *Sideranthus Gooddingii* A. Nels., Bot. Gaz. 37: 266. 1904.

This subspecies includes the more western elements of *Machaeranthera pinnatifida* and, while quite variable, it appears to be a closely knit phyletic group. However, in southern Arizona it appears to intergrade to some considerable extent with elements of var. *chihuahuana*, subsp. *pinnatifida;* indeed, even within the subsp. *Gooddingii* elements from central and southern Baja California (var. *scabrella*, cf. below) approach the var. *chihuahuana* in gross habit and head size; in view of the wholly peninsular distribution and its seemingly clinal intergradation with var.

Gooddingii northwards, we view the *scabrella* populations as parallelisms from within the subspecies rather than reflective of recent genic introduction or exchange from the subspecies *pinnatifida* in this region.

2a. **M. pinnatifida** var. **Gooddingii** (A Nels.) Turner & Hartman, comb. nov., based upon *Sideranthus Gooddingii* A. Nels., Bot. Gaz. 37: 266. 1904. [= *Haplopappus Gooddingii* (A. Nels.) Munz & I. M. Johnston, 1922; *Haplopappus spinulosus* var. *Gooddingii* (A Nels.) Blake].

2b. **M. pinnatifida** var. **paradoxa** Turner & Hartman, var. nov. — A var. *Gooddingii* plantis minoribus, foliis capitula versus minus deminutis, pedunculis brevioribus differt.

Differs from the var. *Gooddingii* in its smaller habit, larger and less reduced (upward) leaves and shorter peduncles.

Holotype (NY): Colorado: Montrose Co., Paradox, June 21, 1912, *E. P. Walker 147* (DS, GH, US, isotypes).

Eleven aditional collections from the same general area were examined as follows: Colorado: *Maguire & Piranian 12479* (GH); *Payson 662* (GH); *Baker 79* (CAS, DS, GH, NY, UC, US); *Rollins 2183* (DS, GH, UC, US); *Walker 446* (DS, GH, NY, US); *Purpus* (FM, UC); *Osterhout 4266* (NY); *Ripley & Barneby 5428* (NY). Utah: *Walker 359* (DS, GH, US); *Ripley & Barneby 5389* (NY). Arizona: *Turner 5844* (TEX).

The variety is fairly well marked and does not seem to intergrade with its more eastern allopatriarch, var. *pinnatifida*. According to label data and from our own observations it seems largely restricted to dry gravelly foothills occurring in mostly bare clay soils at elevations of 5800–9000 feet. While centered in west-central Colorado about Paradox (hence its name), it does appear to grade into var. *Gooddingii* to the southwest, although not strikingly so.

2c. **M. pinnatifida** var. **scabrella** (Greene) Turner & Hartman, comb. nov. — *Eriocarpum scabrellum* Greene, Erythea 2: 108. 1894. [= *Haplapappus spinulosus* var. *scabrellus* (Greene) Blake, 1917; = *Haplopappus spinulosus* subsp. *scabrellus* (Greene) H. M. Hall, 1928; = *Machaeranthera scabrella* (Greene) Shinners, 1950].

The type locale for this taxon is Bahia de Los Angeles, central Baja California, in the northernmost portion of its distribution (fig. 40). It extends south from this area almost to the cape where it is replaced by *Machaeranthera arenaria*. The latter taxon is closely related to the var. *scabrella*, presumably intergrades to some degree with it, and might with some justification be treated as yet another variety within the subspecies *Gooddingii*. However, in its extreme form (oblanceolate, tomentose foliage, herbaceous, recurved involucral bracts, etc.; e.g. *Hartman et al. 3523*, (TEX) *M. arenaria* is amply distinct and we have chosen to retain it as a separate species.

Johnston (1924) included as varieties under the species *Machaeranthera arenaria* (as *Haplopappus arenarius*) the names var. *incisifolius* and var. *Rossii*, both being applied to insular populations off the eastern coast of the peninsula. We can recognize var. *incisifolius* (cf. below) from San Lorenzo Island but not his var. *Rossii* (*Haplopappus arenarius* Benth.

var. *Rossii,* 1924) from San Marcos Island which, in our opinion, is no more than a weakly differentiated populational element of the fairly widespread and quite variable, var. *scabrella.*

Johnston included both his named varieties under *Machaeranthera arenaria,* this being a logical and correct nomenclatural treatment since he included much of what we take to be var. *scabrella* in his concept of *M. arenaria.* That is, he assumed the latter taxon to be the predominant insular form from Cape Lucas north along the eastern coast to near Bahia de Los Angeles. We differ in believing that *M. arenaria* is confined to the immediate Cape region, having had little to do with the origin of the more northern insular populations, which seem largely to have arisen in relatively recent times from the var. *scabrella.*

2d. **M. pinnatifida** var. **incisifolia** (I. M. Johnston) Turner & Hartman, comb. nov. — *Haplapappus arenarius* var. *incisifolius* I. M. Johnston, Proc. Calif. Acad. Sci. 12: 1190. 1924.

As indicated above, this is a weakly differentiated insular taxon (known only from San Lorenzo Island) which is readily recognized from its closest convariant, var. *scabrella,* by its incised leaves.

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Fig. 43. Elias Contreras at Tikal, Guatemala in 1964. Collecting in Guatemala and Belize, which began in 1959 as my field assistant, he has contributed significantly to our knowledge of the flora of the region. His collections from Peten in the Lundell Herbarium now equal in number those of all other collectors combined. Photographed by C. L. Lundell.

STUDIES OF AMERICAN PLANTS – XIII

CYRUS LONGWORTH LUNDELL

In 1525 Hernan Cortes with his army traversed the Department of Peten, Guatemala from northwest to southeast, the first European to enter and cross the region. His march across the heart of the Maya area has been termed one of the outstanding achievements in human history (S. G. Morley, Carnegie Inst. Wash. Publ. 437, vol. 1: 8–19. 1938).

It was in the rugged extension of the Maya Mountains into southeastern Peten that Cortes met his most difficult test. Between Rio Machaquila and Rio Sarstun, the southeastern boundary of Peten, there is an area of mountainous terrain that is precipitous and tortuous, an area Cortes called one of "the marvels of the world." Although only 8 leagues in length, his army took no less than twelve days to cross it. Sixty eight of his horses either died from falling down the slippery precipitous slopes, or had to be abandoned because of having broken their legs, and all the others of his army were so badly maimed and crippled it was thought they would never be of use again. On the twelfth day he reached the Sarstun River below the rapids called Gracias a Dios (Morley, l.c., pp. 17–19).

This is the La Cumbre country in which so many notable plant discoveries have been made. I visited the region for the first time in 1959. To commemorate the heroic odyssey of Hernan Cortes through this great rugged rainforest, I name *Chiclea Cortesiana*, a gum yielding tree of the Sapotaceae, in his honor.

Other species in the Lauraceae, Rutaceae, Sapotaceae and Rubiaceae are included from Mexico and Guatemala.

LAURACEAE

Misanteca areolata (Lundell) Lundell, comb. nov. – *Licaria areolata* Lundell, Wrightia 4: 156. 1971.

RUTACEAE

Zanthoxylum petenense Lundell, sp. nov. – Arbor; ramuli graciles, glabri; folia inermia, glabra, pinnata, foliolis 4 vel 5, raro 2–7; foliola petiolulata, chartacea, lineari-lanceolata, anguste lanceolato-oblonga vel oblanceolata, 4–9 cm. longa, 1–2 cm. lata, raro ad 3 cm. lata, apice acuminata, basi acuta vel inaequaliter acuta, crenulata vel raro crenata; inflorescentia terminalis, paniculata, ad 8 cm. longa, 11 cm. lata, glabra; flores 4-meri, pedicellati, glabri; sepala ovata, parvissima, ciliolata vel erosa; fructus 3–3.5 mm. diam., glandulosus.

Tree, up to 16 m. tall, 30 cm. diam., the branchlets slender, glabrous, unarmed; leaves pinnate, glabrous, the petioles elongated, slender; leaflets usually 4 or 5, sometimes 2–7, the petiolules of lateral leaflets short, those of terminal (when present) up to 8 mm. long, the leaf rachis and petiolules canaliculate; leaflets chartaceous, linear-lanceolate, narrowly lanceolate-oblong or the terminal oblanceolate, 4–9 cm. long, 1–2 cm. wide, the terminal sometimes up to 3.2 cm. wide, acuminate, the base acute and decurrent on petiolule, mostly inaequilateral, the margin conspicuously

crenulate, sometimes crenate; inflorescences glabrous, terminal, openly paniculate, the branches slender; flowers apparently 4-parted; fruiting pedicels up to 3 mm. long; sepals 4, ovate, minute, ciliolate or erose; follicles very small, globose, 3–3.5 mm. diam., conspicuously glandular; seeds black, glossy, 2.5–3 mm. diam.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, on Pusila Road, about 5 km. north, Aug. 19, 1976, *C. L. Lundell & Elias Contreras 20221* (LL, type), tree, 50 ft. tall, 12 in. diam., fruits green; La Cumbre, in *zapotal* on top of hill, 3 km. east, Aug. 28, 1976, *Lundell & Contreras 20267* (LL), tree 50 ft. high, 8 in. diam., fruits green.

Z. petenense, glabrous throughout, has comparatively few narrow crenulate or crenate leaflets and very small follicles. Its affinity is to *Z. nigripunctatum* Lundell which has been confused with *Z. mayanum* Standl.

SAPOTACEAE

Chiclea Cortesiana Lundell, sp. nov. — Arbor; ramuli crassi, novelli tomentelli; folia glabriuscula, longe petiolata, petiolo ad 3.7 cm. longo; lamina chartacea vel subcoriacea, oblanceolata vel anguste oblongo-elliptica, 11–20 cm. longa, 2.3–6 cm. lata, apice acuminata, basi acuta; flores racemoso-fasciculati, terminales; pedicelli tomentelli, 1–1.8 cm. longi; sepala tomentella, 6–8, coriacea, 8–10 mm. longa, exteriora ovata, acutiuscula, interiora elliptica, apice rotundata; corolla subcoriacea, 10–11 mm. longa; petala 6 vel 7, basi coalita ca. 3.5 mm., lobis lateralibus 5–8 mm. longis, oblique lanceolato-ellipticis vel ovatis, imbricatis, lobo medio oblanceolato, 4–5 mm. longo, 1.4 mm. lato, unguiculato, apice obtuso, eroso; staminodia 6 vel 7, carnosa, inflexa, pubescentia, ca. 1.5 mm. longa, 2–2.2 mm. lata, subtruncata; stamina 6 vel 7, ca. 5 mm. longa; ovarium tomentosum, basi oblatum, 8- vel 9-loculare; stylus crassus, 7–9 mm. longus.

Tree, about 25 m. high, 45 cm. diam., the branchlets thick, tomentellous apically at first; leaves large, crowded at apex of branchlets, glabrous at maturity, long petiolate, the petioles slender, up to 3.7 cm. long; leaf blades chartaceous or subcoriaceous, oblanceolate or narrowly oblong-elliptic, up to 20 cm. long, 6 cm. wide, apex acuminate, base acute, the midvein elevated beneath, shallowly impressed above, the lateral veins very slender, the surface striate; flowers fasciculate in short terminal leafless racemes; pedicels rather stout, 1–1.8 cm. long; sepals finely tomentellous like the pedicels, 6–8, subcoriaceous, 8–10 mm. long, the exterior shorter, ovate, acutish, the interior elliptic, rounded at apex, thinner; corolla rather leathery, 10–11 mm. long; petals 6 or 7, united at base into tube about 3.5 mm. long, inconspicuously pubescent on outer surface in narrow area at sinuses, 3-lobed, the lateral lobes asymmetric and very unequal, 5–8 mm. long, the larger lateral lobe obliquely lanceolate-elliptic, 7–8 mm. long, about 3 mm. wide, the smaller lateral lobe ovate, 5–6 mm. long, 4 mm. wide, the lateral lobes strongly overlapping, subentire at apex, the inner medial lobe shorter than lateral, oblanceolate, about 4.5 mm. long, 1.4 mm. wide, clawed at base, apex obtusish and subentire; staminodia 6 or 7, attached at apex of tube, fleshy, tightly inflexed, pubescent, about 1.5 mm. long, 2–2.2 mm. wide, subtruncate; stamens 6 or 7, attached at

apex of tube, about 5 mm. long; filaments turning inward and upward at right angles, about 1.5 mm. long; anthers lanceolate, 3 mm. long, sagittate at base, acutish at apex, pubescent medially on dorsal side; ovary oblate at base, tomentose, 8- or 9-loculate; style thick, glabrous, 7–9 mm. long, exserted, narrowed to the obtuse stigma, the stigma obscurely short-lobed.

Guatemala: Dept. Peten, La Cumbre, on top of hill in *zapotal*, about 1.5 km. on Pusila Road, July 27, 1976, *C. L. Lundell & Elias Contreras 20099* (LL, type), tree, 80 ft. high, 18 in. diam., flowers white, "*chiquibul*".

Closely related to *C. guatemalensis* Lundell, the much larger leaves of *C. Cortesiana*, the racemose-fasciculate terminal inflorescences, the very unequal lateral lobes of the petals and the unguiculate inner medial lobe, together with the 8- or 9-loculate ovary are differences which distinguish it.

Dipholis lenticellata Lundell, sp. nov. — Arbor; ramuli graciles, lenticellati; novelli adpresse rubro-pubescenti; folia parva; petiolata, petiolo 3–6 mm. longo; lamina subchartacea, glabrescentia, oblanceolata vel anguste oblongo-elliptica, 4–8 cm. longa, 1.5–3 cm. lata, apice obtusa vel abrupte acuminata, acumine obtuso, basi acuta, nervis lateralibus 9–12-jugis; flores 5-meri, fasciculati; pedicelli fructiferi crassiusculi, 3–4 mm. longi; sepala 5, glabrescentia, coriacea, ovato-orbicularia, ca. 2 mm. longa, apice rotundata; fructus ellipsoideus vel obovoideus, 8–10 mm. longus, apiculatus.

Tree, about 12 m. high, 25 cm. diam., the branchlets slender, lenticellate, at first pubescent with appressed reddish hairs, glabrescent; leaves sparsely pubescent at first with reddish hairs, glabrescent, petiolate, the petioles slender, 3–6 mm. long; leaf blades firm, subchartaceous, oblanceolate, or rather narrowly oblong-elliptic, 4–8 cm. long, 1.5–3 cm. wide, apex obtusely and abruptly short acuminate or obtuse, base acute, midvein elevated beneath, shallowly impressed above, the primary lateral veins very slender and rather obscure, 9–12 pairs; flowers 5-parted, fasciculate mostly in the leaf axils, not densely so; fruiting pedicels rather thick, 3–4 mm. long; sepals coriaceous, ovate-orbicular, about 2 mm. long, the outer smaller, rounded at apex, glabrescent; fruits ellipsoid or obovoid, 8–10 mm. long, apiculate; seed-scar basal, elliptic, about 1 mm. in diam.; seed-coat smooth, brown.

Guatemala: Dept. Alta Verapaz, Chahal, on top of hill, on El Mago-Sebol Road, in low forest, Oct. 15, 1968, *Elias Contreras 7940* (LL, type), tree, 35 ft. high, 10 in. diam., "*avalo*"; Dept. Peten, La Cumbre, on top of hill, east of km. 141/142 of Cadenas Road, in high forest, Sept. 25, 1966, *Contreras 6225* (LL), tree, 40 ft. high, 8 in. diam., "*avalo*"; La Cumbre, in *zapotal* on top of hill, on Pusila Road 2 km., July 16, 1976, *C. L. Lundell & Elias Contreras 20050* (LL), tree, 40 ft. high, 6 in. diam.

Although these collections have been referred to *D. salicifolia* (L.) A.DC., the population in the high rainforest of southeastern Peten and the adjacent high forest of Alta Verapaz and Izabal has mostly smaller short-petioled leaves broadest above the middle and obtusely short acuminate. The pubescence is reddish and appressed on young growth, but the plants are glabrescent early with the sepals completely glabrous post

anthesis. Further, the oblong-ellipsoid fruits are quite different from the globose and ovoid fruits of *D. salicifolia*. In *Lundell & Contreras 19310* and *19314* from El Estor in the Department of Izabal, the young flowers are small, the petaloid staminodia are obovate rather than ovate as in *D. salicifolia*. The filaments and anthers are shorter, up to 1 mm. and 0.8 mm. long, respectively.

Peteniodendron Lundellii (Standl.) Lundell, comb. nov. *Sideroxylon Lundellii* Standl., Publ. Carnegie Inst. Wash. 461: 79. 1935. *Pouteria Lundellii* (Standl.) L. Wms., Fieldiana, Bot. 31: 264. 1967.

Peteniodendron estoriense (Lundell) Lundell, comb. nov. *Pouteria estoriensis* Lundell, Wrightia 5: 181. 1975.

The types of both of these closely related species have flowers with 2-loculate ovaries with well-developed ovules. Upon further study, I have concluded that these flowers are pistillate, and pseudohermophroditic with the small anthers apparently not functional. In the original description *of P. estoriensis* (l.c.), I stated that the flowers were "apparently staminate."

The two species may be separated as follows:

1. Flowers 4-parted; corolla glabrous, about 2 mm. long, the lobes equalling tube; leaves chartaceous, small, up to 11 cm. long ..... *P. Lundellii*
1. Flowers 4- or 5-parted; corolla about 3 mm. long, appressed pubescent medially on outer surface, the lobes shorter than tube; leaves membranaceous, large, up to 19 cm. long ..... *P. estoriense*

Pouteria briocheoides Lundell, sp. nov. — Arbor; ramuli crassi, tomentosi; folia petiolata, petiolo tomentoso, 1–1.4 cm. longo; lamina glabrata, membranacea, anguste oblanceolata vel oblanceolato-oblonga, 7–17 cm. longa, 2–4.8 cm. lata, apice acuta vel subacuminata, basi acuminata, costis 14–18-jugis, venulis reticulatis; flores sessiles; sepala 4, ovato-elliptica, ad 4.5 mm. longa, exteriora hirsuta, interiora glabra, apice rotundata; corolla glabra, 4.5 mm. longa, subcylindrica, tubo ca. 3 mm. longo, lobis 4, ovalis, ca. 1.5 mm. longis, apice rotundatis vel subtruncatis; staminodia 4, lineari-lanceolata, ca. 1 mm. longa, integra, apice obtusa; stamina 4, ca. 4 mm. longa; filamenta libera ca. 1.2 mm.; antherae ovatae, ca. 1 mm. longae, acutae; ovarium dense hirsutum; stylus crassus, ca. 3 mm. longus, basi hirsutus; stigma capitellata; fructus oblatus, tomentosus, ad 3 cm. diam., 2.5 cm. alta, costatus, apice late conicus, obtusus.

Tree, about 16 m. tall, 25 cm. diam., the branches thick, hirsute-tomentose with brownish hairs; leaves petiolate, the petioles tomentose, slender above, expanded at base, up to 1.4 cm. long; leaf blades glabrate at maturity with some hairs persistent along midvein and at base beneath, membranaceous, narrowly oblanceolate or oblanceolate-oblong, up to 17 cm. long, 4.8 cm. wide, apex acute or subacuminate, base acuminate, the midvein elevated beneath, nearly plane above, the primary lateral veins elevated beneath, widely arcuately ascending, 14–18-pairs, intricately but obscurely reticulate-veined on both surfaces; flowers sessile, sepals 4, ovate-elliptic, the outer pair about 4.5 mm. long, hirsute on outer surface,

glabrous within, the inner pair about 4 mm. long, entirely glabrous, rounded at apex; corolla glabrous, subcylindric, about 4.5 mm. long, the tube 3 mm. long; corolla lobes 4, oval, about 1.5 mm. long, apex rounded or subtruncate, entire; staminodia 4, linear-lanceolate or spatulate, about 1 mm. long, entire, obtuse at apex; stamens 4, about 4 mm. long (including section of filament adhering to tube); free filament about 1.2 mm. long; anthers ovate, about 1 mm. long, acute; ovary oblate, shallowly lobed, the lobes rounded, densely hirsute, with several locules; style thick, about 3 mm. long, the apical 2 mm. glabrous; stigma capitellate, obscurely lobed; fruits brown-tomentose, sessile, up to 3 cm. in diam., oblate and rounded-lobed, abruptly and thickly conical at apex, the apex obtuse; seed (based upon impression in dried fruit), ellipsoid, up to 1 cm. long, with lateral linear-oblong seed-scar up to 6 mm. long.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, about 1.5 km. east of km. 138 of the Cadenas Road, Sept. 4, 1976, *C. L. Lundell & Elias Contreras 20314* (LL, type), tree, 50 ft. high, 10 in. diam., fruit brownish, "*zapotillo*".

From description the species probably has affinity to *P. stylosa* (Pierre) Dubard, but *P. briocheoides* differs in having tomentose-hirsute branchlets, very narrow almost spatulate prominently veined leaves, larger flowers, and tomentose fruits.

The shape of the fruits suggests the French bun called "*brioche*", whence the name.

Pouteria sebolensis Lundell, sp. nov. – Arbor, ca. 13 m. alta, ramuli graciles; folia petiolata, petiolo 7–9 mm. longo; lamina subcoriacea, glabrescentia, oblanceolata, 9–12.5 cm. longa, 2.7–3.8 cm. lata, apice abrupte acuminata, basi subcuneata, acuta; flores dioici, ad axillas vel nodos defoliatos fasciculati vel breviter subspicati. *Flores pistillati*: unisexuales; pedicelli ad 1.3 mm. longi; sepala 4–6, exteriora parva, late ovata, apice rotundata, interiora late ovato-elliptica, ad 2 mm. longa, parce sericea; corolla glabra, campanulata, ad 3 mm. longa, lobis 4–6, late ovatis, ad 1.3 mm. longis; staminodia subulata; stamina abortiva, ca. 0.7 mm. longa; ovarium hirsutum, 4- vel 5-loculare; ovula 4 vel 5; stylus crassus.

Tree, about 13 m. tall, the buds appressed pubescent, the hairs reddish, the slender branchlets essentially glabrous; leaves petiolate, the petioles 7–9 mm. long, glabrescent; leaf blades subcoriaceous, essentially glabrous at maturity, oblanceolate, 9–12.5 cm. long, 2.7–3.8 cm. wide, apex abruptly acuminate with a narrow obtusish acumen up to 8 mm. long, base subcuneate, acute and decurrent, the primary lateral veins 7–11, conspicuous beneath blade, less so above, the midvein elevated beneath, shallowly sulcate above; flowers dioecious, fasciculate in leaf axils or at defoliated nodes, or laterally subracemose, the pedicels stout, up to 1.3 mm. long. *Pistillate flowers*: unisexual; sepals 4–6, unequal, the exterior smaller, depressed-ovate, rounded, the interior broadly ovate-elliptic or suborbicular, up to 2 mm. long, sparsely sericeous with reddish hairs; corolla glabrous, campanulate, up to 3 mm. long, the lobes 4–6, suberect, about half as long as corolla tube, broadly ovate-rounded and inconspicuously

subsagittate, sometimes minutely apiculate; staminodia subulate, expanded at base, shorter than lobes, attached at apex of tube; stamens shorter than staminodia, abortive, the anthers and filaments subequal, attached at apex of tube; ovary hirsute, 4- or 5-loculate; ovules solitary in each locule; style glabrous, thick. Staminate flowers and fruits not known.

Guatemala: Dept. Alta Verapaz, along Rio Sebol, downstream from Carrizal, alt. 150–200 m., April 19, 1942, *Julian A. Steyermark 45789* (F, type; LL, isotype), tree 40 ft. tall, leaves rich green and shining above, pale green beneath, firmly membranous or subcoriaceous, flowers pale greenish.

The collection was identified as *Lucuma Durlandii* Standl. by Paul C. Standley. Its small leaves with up to 11 pairs of prominent lateral veins and small greenish pistillate flowers are distinctive. Although the leaves differ, the species has flowers similar to those of *Pouteria Gentlei* Lundell, and the two appear to be related.

RUBIACEAE

Randia mayana Lundell, sp. nov.— Arbor parva, cauliflora, ramulis crassis, glabris; stipulae late ovatae, ca. 8 mm. longae, acuminatae; folia glabra, petiolata, petiolo crasso, 1–1.7 cm. longo; lamina membranacea, late elliptica vel elliptico-lanceolata, 15–30 cm. longa, 5–14 cm. lata, apice acuminata, basi acuta, nervis lateralibus 12–14-jugis; flores glabri, sessiles; hypanthium ca. 7 mm. longum; calyx tubulosus, ad 1.3 cm. longus, lobis 6, subulatis, 5–9 mm. longis; corolla ad 8 cm. longa, lobis 5, lanceolatis, ad 3.5 cm. longis, 1.2 cm. latis, caudato-acuminatis; stigma bilobata, ca. 8 mm. longa; bacca stipitata, subglobosa, ca. 5 cm. longa, 4 cm. lata, nervosa.

Small tree, apparently unarmed, glabrous throughout, with a ring of slender penicillate processes at the nodes, the branchlets thick; leaves thin and large, strictly glabrous, petiolate, the petioles thick, 1–1.7 cm. long, canaliculate; leaf blades membranaceous, broadly elliptic or elliptic-lanceolate, up to 30 cm. long, 14 cm. wide, acuminate at apex, broad and acute at base, slightly decurrent on petiole, the primary lateral veins slender, widely arcuately ascending, 12–14-pairs; flowers solitary, borne on old wood on bracteate spurs up to 1 cm. long; flowers unisexual, strictly glabrous, drying black, the hypanthium about 7 mm. long; calyx tubular, up to 1.3 cm. long, the 6 lobes subulate and filiform apically, unequal, 5–9 mm. long, erect; corolla up to 8 cm. long including lobes, the tube slender, up to 4.5 cm. long, the 5 lobes lanceolate, up to 3.5 cm. long, 1.2 cm. wide, caudate-acuminate; throat glabrous; stigma bilobate, about 8 mm. long, exserted slightly in throat; fruit with stout stipe up to 1.4 cm. long, subglobose, about 5 cm. long, 4 cm. wide approaching maturity, the pericarp hard, veiny.

Guatemala: Dept. Baja Verapaz, Niño Perdido, in high forest on top of hill, east of km. 150/151, Aug. 30, 1975, *C. L. Lundell & Elias Contreras 19758* (LL, type, isotype), small tree, 25 ft. high, 4 in. diam., flowers white, fragrant, fruit green.

This glabrous unarmed tree with its large solitary flowers borne on

short bracteate spurs on old wood, large thin leaves, and stipitate fruits is unlike any taxon known from the region. It is probably related to *R. monantha* Benth.

Rondeletia albida Lundell, sp. nov. – Frutex; ramuli graciles, minute arachnoideo-tomentelli; folia opposita, parva, supra glabrescentia, subtus dense et minute arachnoideo-tomentella, albida, petiolata, petiolo 3–12 mm. longo; lamina chartacea, anguste lanceolata, 3.5–9.5 cm. longa, 0.9–2 cm. lata, apice caudato-acuminata vel acuminata, basi attenuata, acuminata, nervis lateralibus 7–11-jugis; inflorescentia albida, parva, minute et dense arachnoideo-tomentella, terminalis, 3–8 cm. longa, cymis breviter pedunculatis in paniculas spiciformes dispositis; flores tetrameri, sessiles vel subsessiles, calycis lobis 0.5–0.7 mm. longis, obtusis, subaequalibus; corollae tubo minute arachnoideo, ca. 7 mm. longo superne paulo dilatato, lobis rotundatis 1.5–2 mm. longis, ore nudo; antherae lineari-oblongae, 3 mm. longae, inclusae; semina ovoidea, ad 1.9 mm. longa, rugosa, acute scrobiculata.

Probably a shrub, the branchlets slender, at first densely and minutely arachnoid with white tomentum; stipules triangular-subulate, short; leaves opposite, glabrous above early, persistently and densely arachnoid with minute appressed white tomentum beneath, the 7–11-pairs of primary veins evident, petiolate, the petioles slender, 3–12 mm. long; leaf blades chartaceous, narrowly lanceolate, up to 9.5 cm. long, 2 cm. wide, acuminate at apex and base; inflorescences terminal, with white tomentum like the apex of branchlets, 3–8 cm. long, the cymes short pedunculate in spiciform panicles; flowers 4-parted, sessile or subsessile, the calyx lobes small, ovate-oblongish, 0.5–0.7 mm. long, obtuse, subequal; corolla tube arachnoid, about 7 mm. long, attenuate to the base, the lobes rounded, subequal, 1.5–2 mm. long, one somewhat larger and undulate; throat glabrous; stamens with short filaments, the anthers included, linear-oblong, about 3 mm. long; stigma exserted, subequalling corolla lobes; capsules ellipsoid, up to 4 mm. diam.; seeds large, ovoid and compressed, up to 1.9 mm. long, sharply scrobiculate.

Mexico: Chiapas, Carelas, near Motozintla, alt 2176 m., April, 1945, *Eizi Matuda 5509* (LL, type, isotype).

In the *Laniflorae*, the taxon obviously is related to *R. buddleoides* Benth., a complex of distinct species apparently confused by the white arachnoid tomentum. Its thick corolla tube, large anthers up to 3 mm. long, small suberect calyx lobes almost concealed by the tomentum, exserted stigma, and few large sharply scrobiculate ovoid seed well-mark this narrow-leaved species.

Rondeletia belizensis Standl. var. **longiloba** Lundell, var nov. – Arbor parva; ramuli puberuli; folia petiolata, ovato-elliptica vel ovalia, ad 7 cm. longa, 3.5 cm. lata, apice obtusa vel rotundata, basi rotundata vel raro acutiuscula; inflorescentia terminalis, cymoso-corymbosa, parvissima, puberula; flores 4-meri; calycis lobis lineari-spatulatis, ad 5 mm. longis; corollae tubo ca. 1 cm. longo, lobis ad 5 mm. longis, intus villosis; capsula globosa, 5–6 mm. diam.

Small tree, the branchlets and petioles puberulent, the leaves otherwise

glabrous except for the barbate axils of the primary veins and puberulent midvein on lower surface, the variety differing in its elongated calyx lobes and larger corolla lobes up to 5 mm. long, more than twice the usual size.

Guatemala: Dept. Alta Verapaz, Rubelsanto, in *zapotal* on top of hill, about 2.3 km. SEE of Balastrera, July 20, 1975, *C. L. Lundell & Elias Contreras 19545* (LL, type), small tree, 25 ft. high, 4 in. diam., flowers white.

With the large series of collections now available, *R. belizensis* is well defined. The new variety, on the western side of its range, should be found in Chiapas. The species has leaves barbate beneath in the leaf axils throughout its range, and the petioles are puberulent like the stems and midvein beneath.

Rondeletia Cordovana Standl. & Steyerm., Field Mus. Bot. 23: 26. 1943.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, east of km. 154, April 16, 1975, *C. L. Lundell & Elias Contreras 19210* (LL), shrub, 12 ft. high, 2 in. diam., flowers white.

The species was based on incomplete material, but the collection from Baja Verapaz appears to be referable to *R. Cordovana*.

In *Lundell & Contreras 19210*, in flower and fruit, the strigillose corolla is about 1.5 cm. long with the tube 1.2 cm. long, the suborbicular spreading lobes 3–3.5 mm. long. The throat is glabrous, and the stamens, about 2.8 mm. long, are included. The short style is only 7 mm. long. The ovoid-oblong capsules are about 5.5 mm. long. All parts including branchlets have a strigillose indument which even persists along the primary veins of the leaves on both surfaces.

Rondeletia falciformis Lundell, sp. nov. — Frutex vel arbor parva; ramuli graciles, parce strigillosi; folia opposita, petiolata, petiolo 3–7 mm. longo; lamina membranacea, subglabra, ovata vel lanceolata, 5–14 cm. longa, 2.2–4.3 cm. lata, apice longicaudata, falcata, basi acuta; inflorescentia parce strigillosa, axillaris; flores tetrameri, cymis in paniculas elongatas spiciformes dispositis, ad 5 cm. longis, pedicellis 1–1.5 mm. longis, calycis lobis parvis triangularibus acutis; corollae tubo tenui, ca. 1.2 cm. longo, lobis rotundatis undulatis 2–2.5 mm. longis, ore nudo; stamina inclusa; stigma exserta.

Shrub or small tree up to 4 m. high; branchlets very slender, sparsely strigillose; leaves opposite, the stipules triangular, subulate, 2–3 mm. long, the petioles slender, up to 7 mm. long, sparsely strigillose; leaf blades essentially glabrous, barbate sometimes in leaf axils and sparingly strigillose along veins at first, membranaceous, ovate or lanceolate, 5–14 cm. long, 2.2–4.3 cm. wide, the apex caudate-acuminate, usually falcate, the base acute; inflorescences axillary, sparsely strigillose, very slender, the rachis up to 5 cm. long, the 4-parted flowers in 1–3-flowered cymes borne on short branches along the rachis; pedicels short, 1–1.5 mm. long; hypanthium ellipsoid, equalling pedicels; calyx dentate, the lobes unequal, the longest less than 1 mm. long, acutish; corolla tube slender, essentially glabrous, only sparsely strigillose, about 1.2 cm. long, the lobes rounded,

spreading, undulate, 2–2.5 mm. long; throat glabrous; stamens included in tube; stigma exserted.

Mexico: Hidalgo, in *Liquidambar* forest, on mountainside, km. 332 of Mexico City – Laredo Highway, above Chapulhuacan, alt. ca. 3800 ft., July 13, 1943, *C. L. Lundell 12234* (LL, type), tree, 3 in. diam., 12 ft. high, corolla white; in ravine on mountainside, km. 340 of highway, between Chapulhuacan and Tamazunchale, Aug. 20, 1943, *C. L. Lundell & Amelia A. Lundell 12420* (LL), slender shrub, corolla white.

Of uncertain relationship, *R. falciformis* is notable for its slender axillary spiciform inflorescences with 1–3-flowered cymes borne on short branches along the rachis. Its caudate leaves are mostly falcate. The indument is sparse and consists of short dibrachiate hairs.

Rondeletia longipetiolata Lundell, sp. nov. – Frutex; ramuli graciles, arachnoideo-tomentelli; folia longe petiolata, petiolo 1–4 cm. longo; lamina membranacea, supra glabrescentia, subtus dense et minute arachnoideo-tomentella, albida, lanceolata, 10–23 cm. longa, 2–6 cm. lata, apice acuminata, basi angustata, acuminata, nervis lateralibus 7–9-jugis; inflorescentia terminalis, albido-arachnoidea, ad 20 cm. longa, cymis pedunculatis in paniculas spiciformes dispositis; flores tetrameri, sessiles, calycis lobis ligulatus, inaequalibus, ad 1.4 mm. longis, obtusis; corollae tubo parce arachnoideo, 7–8 mm. longo, anguste tubuloso, lobis rotundatis ad 2 mm. longis, obtuso-fimbriatis vel lobulatis, ore nudo; antherae oblongae, ca. 1.5 mm. longae, inclusae; stigma inclusa.

Probably a shrub, the slender branchlets white-arachnoid with fine tomentum at apex, glabrescent; stipules triangular-subulate, up to 4 mm. long; leaves opposite, large, thin, glabrescent above, persistently arachnoid beneath with fine appressed white tomentum, petiolate, the petioles long and slender, up to 4 cm. long; leaf blades lanceolate, up to 23 cm. long, 6 cm. wide, apex acuminate, base attenuate, acuminate, the primary lateral veins slender, sharply ascending in a curve, 7–9-pairs; inflorescences terminal, white-arachnoid, up to 20 cm. long, the dense cymes slender-pedunculate in spiciform narrow panicles; flowers 4-parted, sessile, secund; hypanthium densely white-arachnoid; calyx lobes ligulate, very unequal, the longer equalling hypanthium, up to 1.4 mm. long, obtuse; corolla tube slender, not expanded above, 7–8 mm. long, the spreading lobes rounded, up to 2 mm. long, all conspicuously fimbriate-lobed, the minute lobes obtuse; throat glabrous; anthers oblong, about 1.4 mm. long, included in top of tube; style and stigma included, short, only 4–5 mm. long.

Mexico: Chiapas, Mt. Ovando, near Escuintla, Nov. 14, 1945, *Eizi Matuda 6146* (LL, type, isotype).

Of the *Laniflorae*, *R. longipetiolata* has the long petioles and large leaves resembling *R. septicidalis* B. L. Robinson, but the persistent compact arachnoid tomentum indicates a closer relationship to *R. buddleoides* Benth. The fimbriate-lobed corolla lobes, included style and stigma less than 5 mm. long, the thin long-petioled large leaves, the white hypanthium with dense arachnoid tomentum, contrasted with the thinly arachnoid

corolla, and the secund sessile flowers are features distinguishing *R. longipetiolata*.

Rondeletia minor Lundell, sp. nov. — Frutex; ramuli graciles, parce et minute arachnoideo-tomentelli; folia opposita, petiolata, petiolo 3–15 mm. longo; lamina membranacea, anguste lanceolata, 4.5–17 cm. longa, 1.6–5.3 cm. lata, apice acuminata, basi attenuata, acuminata, nervis lateralibus 7- vel 8-jugis; inflorescentia minute arachnoideo-pubescentia, pedunculata, ad 15 cm. longa; floribus parvis tetrameris, cymis breviter pedunculatis in racemos terminales et axillares dispositis; calycis lobis lanceolatis inaequalibus ad 0.7 mm. longis; corolla glabra, tubo ca. 4 mm. longo, lobis ovatis ca. 1 mm. longis, apice rotundatis, ore nudo; stylus ca. 5 mm. longus; stigma exserta.

Shrub, straggly, up to 2 m. tall, the branchlets very slender, at first arachnoid-tomentellous with minute indument which disappears early; stipules triangular-ovate, up to 3 mm. long, acute; leaves opposite, petiolate, the petioles 3–15 mm. long; leaf blades thin, membranaceous, narrowly lanceolate, up to 17 cm. long, 5.3 cm. wide, apex subabruptly acuminate or acuminate, base attenuate, acuminate, the primary lateral veins 7- or 8-pairs, with fine arachnoid tomentum on undersurface at first, glabrescent; inflorescences terminal and axillary, with fine thin arachnoid tomentum, the raceme-like, narrow, pedunculate panicle up to 15 cm. long; flowers 4-parted, sessile or subsessile, in short pedunculate cymes rather remotely scattered along the rachis; calyx lobes shorter than hypanthium, unequal, lanceolate, up to 0.7 mm. long; corolla glabrous, the tube about 4 mm. long, slender, tapering to the narrow base, the lobes spreading, ovate, about 1 mm. long, rounded at apex, glabrous; the throat glabrous; stamens attached in upper tube, the filaments short, the anthers oblongish, about 1 mm. long; style about 5 mm. long, the stigma exserted.

Mexico: Vera Cruz, about 10 miles north of Teziutlan, moist, north-facing ledges, rich soil, Jan. 6, 1964, *D. S. Correll & Helen B. Correll 28736* (LL, type), small shrub, straggly, up to 7 ft., flowers pink.

Referable to the *Laniflorae*, *R. minor* is related to *R. gracilispica* Standl. which has a similar small glabrous corolla.

Rondeletia ovandensis Lundell, sp. nov. — Frutex; ramuli graciles, hirsuti; folia opposita, petiolata, petiolo 3–6.5 mm. longo; lamina membranacea, supra hirtella, subtus dense albo–arachnoidea, elliptica vel ovato-elliptica, 3–8.5 cm. longa, 1.8–5.5 cm. lata, apice acuta vel subacuminata, basi acuta vel rotundata et acutiuscula, nervis lateralibus 7- vel 8-jugis; inflorescentia terminalis, cymis breviter pedunculatis in paniculas spiciformes dispositis; flores parvi, tetrameri; hypanthium minute albo-tomentellum; calycis lobis ovatis, intus glabris, aequalibus, reflexis; corollae tubo arachnoideo, 8–9 mm. longo superne paulo dilatato, lobis ellipticis, 2–2.5 mm. longis undulatis, intus glabris, ore nudo; antherae ca. 1.5 mm. longae inclusae.

Shrub with very slender hirsute branchlets; stipules narrowly lanceolate, up to 4 mm. long, acuminate, pubescent; leaves opposite, petiolate, the petioles slender, 3–6.5 mm. long, hirsute; leaf blades membranaceous,

hirtellous or hirsute above with curved hairs, white arachnoid beneath with dense persistent appressed tomentum, elliptic or ovate-elliptic, 3–8.5 cm. long, 1.8–5.5 cm. wide, apex acute or broadly subacuminate, base acute or rounded and acutish, primary lateral veins slender, 7- or 8-pairs, widely arcuately ascending; inflorescences terminal, open, spike-like with short pedunculate cymes on slender rachis up to 4 cm. long including peduncle about 1 cm. long, the rachis and branches hirsute; flowers small, 4-parted, sessile and scorpoid; hypanthium small, covered with dense white tomentum; calyx lobes ovate, about 0.5 mm. long, spreading, equal or nearly so, glabrous within, corolla tube slender, 8–9 mm. long, arachnoid-tomentulose, the tomentum not as dense as on hypanthium and not white, the lobes elliptic, 2–2.5 mm. long, undulate, glabrous within, the throat glabrous, the tube rather sparsely pubescent inside its entire length; stamens with short filaments, included, the anthers oblongish, about 1.5 mm. long; stigma and style about 7 mm. long.

Mexico: Chiapas, Mt. Ovando, near Escuintla, Oct. 24, 1941, *Eizi Matuda 6067* (LL, type, isotype), shrub.

R. ovandensis belongs in the *Laniflorae,* but does not appear to be closely related to any of the species except possibly *R. buddleoides* Benth. with which it could not be confused. The thin elliptic leaves with persistent white arachnoid tomentum beneath, the hirsute upper surfaces of blades, the slender spiciform inflorescences scarcely half the length of leaves, the small hypanthium with its white tomentum, and slender elongated corolla tube are features distinguishing this rather delicate taxon.

Rondeletia pyramidalis Lundell, sp. nov. – Frutex vel arbor parva, ramulis quadrangularis; folia petiolata, petiolo 1–2.5 cm. longo; lamina chartacea, ovata, ovato-elliptica vel late lanceolata, 8–18 cm. longa, 3–8.5 cm. lata, apice acuta vel acuminata, basi rotundata et acutiuscula vel acuta, supra glabrescentia, subtus dense albo-arachnoidea, nervis lateralibus 11–17-jugis; inflorescentia terminalis, cymoso-paniculata, pyramidalis, multiflora, pedunculata, ad 17 cm. longa, basi ad 10 cm. lata, minute albo-arachnoidea, cymis pedunculatis; flores tetrameri, sessiles vel subsessiles, calycis lobis ovato-oblongis vel oblongis, inaequalibus, reflexis, ad 1.5 mm. longis, intus glabris; corollae tubo minute arachnoideo, 10–11 mm. longo, paulo dilatato, lobis inaequalibus, oblongis vel rotundatis, 2–3 mm. longis, undulatis, intus glabris, ore nudo; antherae lineari-oblongae, ca. 2.2 mm. longae.

Shrub or small tree with rather thick quadrangular branchlets, the internodes short, glabrescent; stipules triangular-subulate, up to 1.3 cm. long, erect and appressed; leaves large, opposite, glabrescent above, with compact persistent arachnoid tomentum on lower surface and petioles, the tomentum rather tawny, the petioles stout, 1–2.5 cm. long; leaf blades chartaceous, ovate, ovate-elliptic or broadly lanceolate, up to 18 cm. long, 8.5 cm. wide, apex acute or acuminate, base rounded and acutish or narrowed and acute, the primary lateral nerves slender, 11–17-pairs, sharply and arcuately ascending, evident beneath with cross venation between them; inflorescences terminal, large and showy, cymose-

paniculate, pyramidal, multiflowered, pedunculate, up to 17 cm. long, up to 10 cm. wide at the base with bi- or tripinnate basal branches, with fine compact arachnoid tomentum, the cymes pedunculate; flowers 4-parted, secund, sessile or subsessile; hypanthium ellipsoid, arachnoid; calyx lobes reflexed, unequal, oblongish, the larger lobe up to 1.5 mm. long, obtuse-rounded, glabrous on inner surface; corolla tube slender, with fine arachnoid tomentum, only slightly enlarged above, 10–11 mm. long; corolla lobes unequal, oblong or rounded, 2–3 mm. long, undulate, glabrous within; throat glabrous; anthers sessile, linear-oblong, about 2.2 mm. long, exserted slightly; style and stigma longer than tube, the stigma exserted.

Mexico: Chiapas, San Luis, near Siltepec, alt. 1300 m., Jan. 24, 1945, *Eizi Matuda 5292* (LL, type, isotype).

Although this showy plant does not appear to be closely related to any of the species of the group, it obviously is in the *Leucophyllae*. Features of note, aside from its large cymose-paniculate terminal inflorescences, are its quadrangular branches with short internodes and large thin leaves on stout petioles with prominent regularly spaced numerous primary veins. In its quadrangular branchlets and large multinerved leaves, *R. pyramidalis* bears some resemblance to *R. Rekoi* Standl. of Oaxaca, a species with much smaller flowers and bidentate stipules.

Rondeletia subscandens Lundell, sp. nov. — Frutex; ramuli graciles, ad nodos strigosi; folia glabra, petiolata; lamina membranacea, lanceolata, ad 12.5 cm. longa, 4 cm. lata, apice acuminata, basi rotundata; inflorescentia terminalis et axillaris, cymoso-corymbosa, laxa, ad 12.5 cm. longa, parce strigillosa; pedicelli 1.5–4.5 mm. longi; flores 5-meri; calyx minute 5-dentatus; corolla ca. 1.6 cm. longa, intus barbata, tubo ca. 1.3 cm. longo, lobis 5, ovatis vel ellipticis, ad 3 mm. longis; capsula subglobosa, ad 5 mm. diam.; semina foveolata, ca. 1 mm. diam.

Woody vine with very slender subterete branchlets, glabrous except at the nodes, the buds at the nodes strigose; stipules broadly triangular, about 1.5 mm. long, apex subulate, strigose; leaves opposite, barbate in the leaf axils beneath, otherwise glabrous, petiolate, the petioles slender, 5–7 mm. long, canaliculate; leaf blades membranaceous, narrowly lanceolate, 6–12.5 cm. long, 1.2–4 cm. wide, apex acuminate, caudate, base rounded, midvein elevated beneath, acutely impressed above, the veins very slender, the primary 5–7 pairs, inconspicuously barbate in the axils; inflorescences terminal and axillary, cymose-corymbose, very open and lax with elongated slender peduncles and branches, up to 12.5 cm. long, sparsely strigillose with subappressed hairs; pedicels slender, up to 4.5 mm. long; flowers 5-parted; hypanthium ellipsoid, up to 1 mm. long, sparsely strigillose; calyx 5-dentate, the minute acutish teeth about 0.3 mm. long; corolla essentially glabrous, about 1.6 cm. long, the tube about 1.3 cm. long, very slender below, densely barbate in the expanded throat, the lobes spreading, ovate or elliptic, 2.5–3 mm. long, rounded at apex; stamens included, 2 mm. long; capsules subglobose, about 5 mm. in diam.; seeds compressed, foveolate, about 1 mm. in diam.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, about

500 m. west of km. 142/143 of the Cadenas Road, Sept. 10, 1976, *C. L. Lundell & Elias Contreras 19830* (LL, type), woody vine, fruit green.

Referable to the *Amoenae*, *R. subscandens* resembles *R. ligustroides* Hemsl. but differs at once in its elongated very slender corolla tube up to 1.6 cm. long, and corolla lobes up to 3 mm. long. *R. ligustroides* is described by Standley (N. Am. Fl. 32: 50. 1918) as having stout corolla tube only 5–6 mm. long, with lobes 1–1.5 mm. long. From description, *R. Edwardsii* Standl., a glabrous species from Honduras, appears to be related.

Rondeletia yucatanensis Lundell, sp. nov. – Frutex; ramuli graciles; folia subsessilis, petiolo ad 3 mm. longo; lamina membranacea, supra parce arachnoidea, subglabra, subtus dense albo-arachnoidea, anguste lanceolata vel lineari-lanceolata, 4–10 cm. longa, 0.5–1.8 cm. lata, apice cuspidata, basi acuta; inflorescentia terminalis, cymoso-paniculata, longe pedunculata, pauciflora, albo-arachnoidea; flores 4-meri, sessiles; calycis lobis inaequalibus, 4–9 mm. longis, cuspidatis; corolla ad 2.3 cm. longa, tubo 1.6–1.8 cm. longo, lobis rotundatis ad 5 mm. longis, ore nudo; antherae oblongae, 2 mm. longae; stylus ad 12 mm. longus.

Willow-like shrub, about 2.5 m. tall, with slender erect branchlets, conspicuously white-arachnoid with fine tomentum; stipules triangular-subulate, up to 8 mm. long; leaves opposite, willow-like, subsessile, the petioles up to 3 mm. long; leaf blades membranaceous, nearly glabrous above, persistently white-arachnoid beneath, lanceolate or linear-lanceolate, 4–10 cm. long, 0.5–1.8 cm. wide, the apex cuspidate, the base acute, the primary veins sharply ascending, 6 or 7 pairs, the midvein and veins slightly impressed above; inflorescences terminal, cymose-paniculate, with elongated peduncles; flowers 4-parted, sessile, subtended by slender elongated bractlets; hypanthium about 1.7 mm. long, with white arachnoid tomentum; calyx lobes slender, cuspidate, subequal or to very unequal, 4–9 mm. long, the elongated lobe twice the length of the other three; corolla tube white-arachnoid, 1.6–1.8 cm. long, slender, lobes suborbicular, up to 5 mm. long, glabrous except below middle on outer surface, reflexed, crenate; throat of tube glabrous, the stamens included, sessile, the anthers oblong, about 2 mm. long; stigma and style 11–12 mm. long.

Mexico: Yucatan, Chichen Itza, April 28, 1950, *J. T. Baldwin Jr. 14230* (LL, type), to 8 ft. with rose flowers.

R. yucatanensis closely resembles *R. leucophylla* H.B.K. of the *Leucophyllae*. Its elongated slender internodes, cuspidate leaves, and calyx lobes often with the larger one twice the length of the three smaller ones, are features which appear to distinguish the Yucatan taxon. *R. stenosiphon* Hemsl. (*R. Lundelliana* Standl.) is the only species previously reported from Yucatan on the basis of the E. P. Johnson type collection (K), which may have come from Tabasco.

ETHNOBOTANICAL NOTES FROM GUATEMALA

(Continued from page 299)

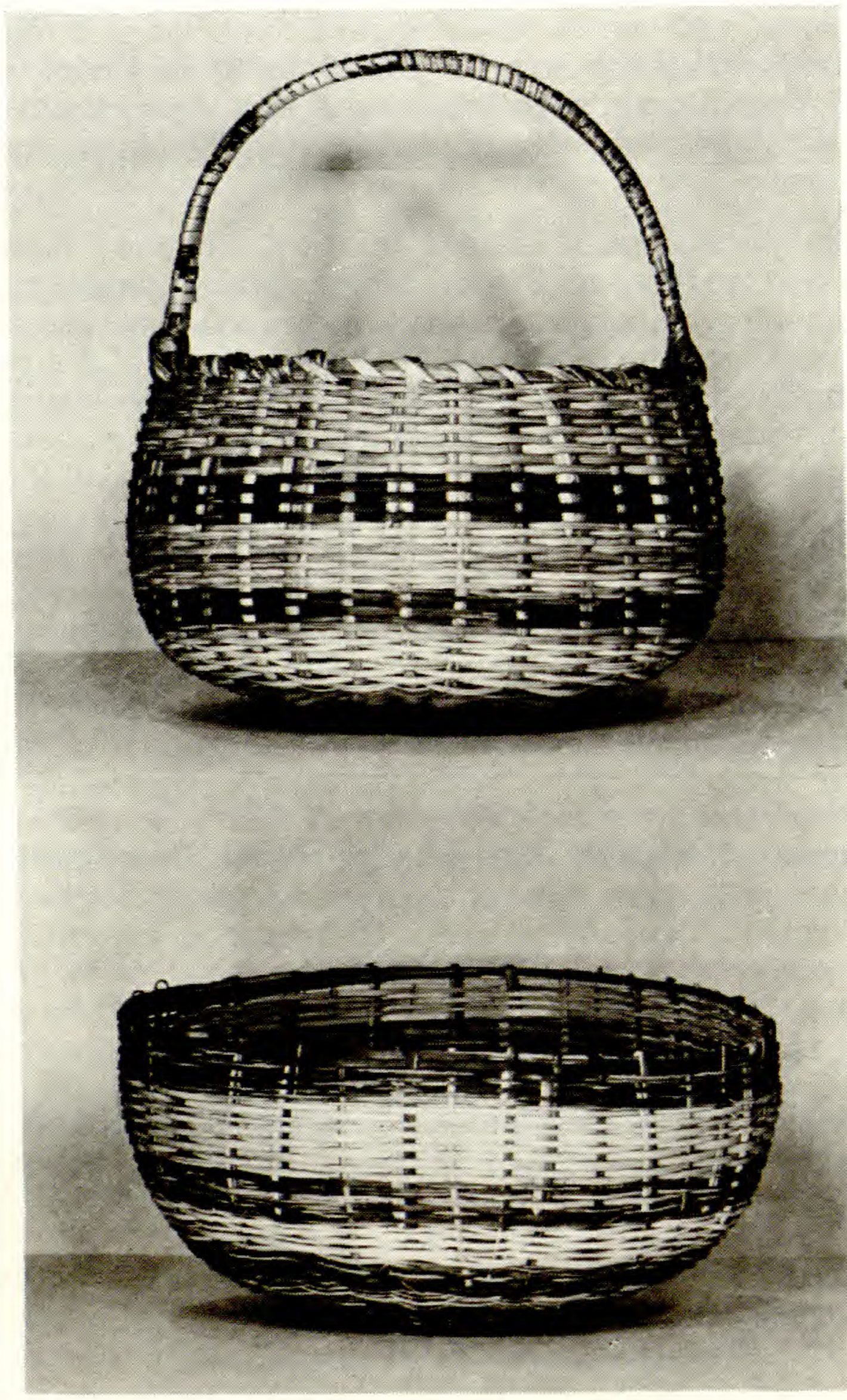

Fig. 44. Bayal baskets from La Libertad, Peten. The top one with handle is the *xack capt* of the Maya, the lower one the *xack* (fide Aguilar). Made from strips of the flexible stems of species of the scandent palm of the genus *Desmoncus*, these are very strong and durable baskets which are very useful. Ethnobotanical photographs by C. L. Lundell.

VOLUME 5 MAY, 1977 NUMBER 9

WRIGHTIA

A BOTANICAL JOURNAL

CONTENTS

PUBLISHED BY

THE UNIVERSITY OF TEXAS AT DALLAS

RICHARDSON, TEXAS

WRIGHTIA

WRIGHTIA, a botanical journal, is a publication, starting with Volume 5, of The University of Texas at Dallas. The contributions are by staff members of The University of Texas at Dallas, The University of Texas at Austin, and collaborators. Each volume will contain a series of numbers. The numbers will be issued at irregular intervals.

VOLUME 5, NUMBER 9
ISSUED MAY 20, 1977

Printed in the U.S.A.
Etheridge Printing Company
Dallas, Texas

WRIGHTIA

VOLUME 5 MAY, 1977 NUMBER 9

STUDIES OF AMERICAN PLANTS – XIV

CYRUS LONGWORTH LUNDELL

In the neotropics, a golden age, comparable to that of the eighteenth and nineteenth centuries, beckons plant explorers. Airways and new roads are opening up remote areas of both lowland and mountain forests, some poorly known, others completely unexplored.

From the interior of South America, on the mountain ridges linking Panama and Colombia, north through Central America and even in the less accessible mountain and lowland terrain of Guatemala, Belize and Mexico, hundreds of undescribed taxa and even notable new genera are being discovered yearly. Genera and species known previously only from the Amazon basin are being found in the rain forest of eastern Guatemala and Belize.

With my continuation of the study of the Lauraceae of the Maya Area, a single example suffices to show how little is still known about important tree genera. There are now at least twenty recognized species of *Misanteca* Cham. & Schlecht. in Mexico and Guatemala. As late as 1924 there were only four: *M. capitata* Cham. & Schlecht., *M. Cervantesii* (H.B.K.) Lundell, *M. misantlae* (Brandeg.) Lundell, and *M. Peckii* I. M. Johnston. My own studies have added fourteen species of *Misanteca* to the known flora of mesoamerica, two of which are described herewith.

In Guatemala the number of taxa in a number of genera have been doubled or tripled during the past three decades in various families, notably the Nyctaginaceae, Lauraceae, Myrtaceae, Myrsinaceae and Sapotaceae.

CRUCIFERAE

Lesquerella gracilis (Hook.) S. Wats. var. **pilosa** Lundell, var. nov. — Herbae annuae, erectae, superne piloso-pubescentes.

Annual herb with erect or ascending stems, the upper stems and base of pedicels pilose with simple or sessile trichomes branched from the base; trichomes of the stems below the inflorescences, as well as those of the leaves, pedicels and flower buds typical of the species.

Texas: Collin County, Coit Meadow on Renner Road, relict blackland prairie, April 6, 1973, *C. L. Lundell 18744* (LL, type), annual, corolla bright yellow.

In favorable seasons the stands of *L. gracilis* are extensive in March, April and May over sections of the relict area of blackland prairie known as the Coit Meadow. In examining these I noted occasional plants with trichomes visible to the naked eye, these trichomes either simple or branched from the base, and densest in the upper inflorescence. The trichomes are suggestive of those of *L. densipila* Rollins.

LAURACEAE

Misanteca clavata (Lundell) Lundell, Wrightia 5: 54. 1974. *Licaria clavata* Lundell, Wrightia 5: 32. 1974.

Guatemala: Dept. Baja Verapaz, Chilasco, in high forest, on Concepcion Road, July 29, 1971, *Elias Contreras 10923* (LL, type), tree, 20 ft. high, 3 in. diam., flowers greenish; Union Barrios, in high forest on top of hill, east of km. 154 of Coban Road, June 7 & 8, 1975, *C. L. Lundell & Elias Contreras 19391* (LL), *19398* (LL), tree 30 to 35 ft. high, 5 to 6 in. diam., flowers yellow-green; same locality, west of km. 153/154 of Coban Road, Aug. 16, 1975, *Lundell & Contreras 19651* (LL), tree 25 ft. high, 3 in. diam., flowers yellow-green, fruit green, *"laurel."*

The species has been known only from the type collection. The margin of the immature cupule is thickened and the minute perianth lobes are persistent. That the margin is double is obscure, but evidenced by a shallow ring which is rather difficult to distinguish in the immature material available.

Misanteca nayaritensis Lundell, sp. nov. — Frutex; ramuli glabri, graciles; folia alternata, glabra, petiolata, petiolo canaliculato, 4–9 mm. longo; lamina chartacea, oblongo-elliptica vel oblanceolata, 6.5–12 cm. longa, 2.2–4 cm. lata, apice subabrupte acuminata, acumine obtusiusculo vel acuto, basi acuta, lamina minute et obscure reticulata; infructescentia axillaris, glabra, 1–1.5 cm. longa, lenticellata; pedicelli fructiferi 2–3 mm. longi; cupula parva, 1–1.2 cm. diam. margine duplo, exteriore recurvo, vix 1.5–2 mm. lato irregulare, interiore vix 2 mm. alto integro; bacca ellipsoidea, 2 cm. longa, 1 cm. diam.

Shrub, semi-recumbent, 1–1.5 m. high, glabrous; branchlets slender; leaves alternate, glabrous, with canaliculate petioles 4–9 mm. long; leaf blades chartaceous, oblong-elliptic or oblanceolate, 6.5–12 cm. long, 2.2–4 cm. wide, apex subabruptly acuminate, the acumen short, about 5 mm. long, obtusish or acutish, base acute, midvein conspicuously elevated beneath, nearly plane above, the primary lateral veins very slender, 8- to 12-pairs, the blade obscurely and minutely reticulate on both surfaces, the veinlets sometimes obscurely impressed above; infructescences axillary, glabrous, small, the slender rachis 1–1.5 cm. long, lenticellate, bearing a single fruit; pedicels narrowly obconical, 2–3 mm. long; cupule small, 6–7 mm. high, about 4.5 mm. deep within, the double margin conspicuous, the outer recurved, 1.5–2 mm. wide, the inner thin, erect, entire, about 2 mm. high; berry ellipsoid, 2 cm. long, 1 cm. in diam.

Mexico: Nayarit, San Blas, Jan. 4, 1944, *Efraim Hernandez X. 136* (LL, type), semi-recumbent shrub, fruit acorn-like. Jalisco, Puerto Vallarta, steep densely-forested hills, south of Playa Los Muertos, alt. ca. 90 m., Mar. 28, 1959, *Annetta Carter & Francia Chisaki 1198* (LL), shrub ca. 1–1.5 m. high, cup reddish when mature.

M. nayaritensis is related to *M. misantlae* (Brandegee) Lundell of Veracruz, and more material of both species is needed to clarify the relationship.

Misanteca Ibarrae Lundell, sp. nov. — Arbor, ramulis glabris; folia coriacea, glabra, petiolata, petiolo 1–1.9 cm. longo; lamina elliptica vel lanceolata, apice subabrupte acuminata, basi acutiuscula, reticulata

venosa et areolata; inflorescentia axillaris, subadpresse pubescentia, paniculata, parva, pedunculata, 2–5 cm. longa, densiflora; pedicelli 1.5–2.5 mm. longi; flores subturbinato; perianthium 6-partitum, glabrum, lobis ovatis, ca. 1 mm. longis, staminodia cyclorum I et II parva, squamiformis, IV stipitiformis; staminia cycli III fertilia, crassa, antheris 2-cellulis; glandulae crassae; ovarium glabrum; stylus conicus, glaber; cupula ca. 1 cm. longa, 1.5 cm. diam.; bacca subglobosa, ca. 1.5 cm. longa.

Tree, 10–20 m. high, up to 20 cm. diam., the branchlets slender at first, becoming thick, drying black, glabrous; leaf buds ciliolate, otherwise glabrous; leaves glabrous, rigidly coriaceous, petiolate, the petioles blackish, 1–1.9 cm. long; leaf blades drying yellow-green, elliptic or lanceolate, up to 15 cm. long, 5.5 cm. wide, mostly smaller and less than 12 cm. long, 4 cm. wide, apex subabruptly acuminate, the acumen obtusish, base acute or acutish, the midrib elevated beneath, convex but nearly plane above, the primary lateral veins 6–9-pairs, slender, rather sharply ascending, anastomosing near the margin, openly but obscurely reticulate, minutely areolate, the upper surface smooth and obscurely areolate; inflorescences axillary, small, narrow, often aggregated below new growth, paniculate, pedunculate, 2–5 cm. long, densely flowered, pubescent with fine short subappressed hairs; pedicels short, 1.5–2.5 mm. long; flowers subturbinate, 2–2.3 mm. long, the hypanthium pubescent like the pedicels; perianth 6-lobed, glabrous, the lobes thick, incurved, ovate, about 1 mm. long, subequal; staminodia of ser. I & II thin, scale-like, shorter than lobes; staminodia of ser. IV stipitiform; stamens of ser. III fertile, thick, 2-celled, with 2 thick basal glands equalling the thick filaments; ovary glabrous, with conical style and punctiform stigma; pedicels of fruits stout, 2–2.5 mm. in diam.; cupules comparatively smooth, about 1 cm. long, 1.5 cm. in diam., the double margin thin, irregular; fruits subglobose, about 1.5 cm. long.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, west of km. 153/154 of Coban Road, Sept. 1, 1975, *C. L. Lundell & Elias Contreras 19780* (LL, type), tree, 60 ft. high, 10 in. diam., flowers yellow-green, fruit green, *"laurel";* same locality, *Lundell & Contreras 19783* (LL), *19796* (LL).

M. Ibarrae, the type of which is a flowering specimen with a mature fruit attached, is closely related to *Misanteca coriacea* (Lundell) Lundell. It differs in having a rather thin obscurely doubled-margined smooth cupule. In *M. coriacea* the cupule is verrucose, not smooth, and conspicuously double-margined with a thin inner margin elevated up to 3 mm., the outer spreading and thick.

In the absence of type material, I am basing my interpretation of *M. coriacea* on two Peten collections, both in immature fruit, *Lundell 18080* (LL) from Sayaxche, and *Contraras 1532* (LL) from Dos Lagunas.

The species is named in honor of Sr. Jorge A. Ibarra, who has so generously helped with my field work in Guatemala.

Nectandra cayoana Lundell, sp. nov. – Arbor, 15 m. alta, ramulis gracilis, subglabris; folia alternata, glabra, petiolis tenuibus, canaliculatis, ad 1.2 cm. longis; lamina chartacea, lanceolata, 6–16 cm. longa, 2.2–5 cm. lata, apice acuminata, basi acuta, costa supra impressa, subtus elevata,

nervis 6–8-paribus, glandulis conspicuis in nervorum lateralium axillis; inflorescentia axillaris et subterminalis, anguste paniculata, ad 4 cm. longa, minute griseo-pubescens; pedicelli 3–5 mm. longi; flores ad 6 mm. longi, 10 mm. diam., lobis reflexis, oblanceolato-ellipticis, intus dense papilloso-pubescentibus, ca. 5 mm. longis; staminibus ser. I & II ca. 1 mm. longis, antheris subreniformibus, ser. III ca. 1.3 mm. longis, conspicue biglandulosis; staminodiis stipitatis, ca. 0.8 mm. longis, gynoecio glabro, ca. 1.4 mm. longo; fructus ellipsoideus, ca. 0.8 mm. diam., cupula vadosa, 4–5 mm. diam., pedicello ad 5 mm. longo apice ad 3 mm. diam. expanso.

Tree 15 m. tall, the branchlets slender, drying blackish, sparsely and minutely subsericeous at first, the buds gray-sericeous; leaves alternate, glabrous early except in the axils of the nerves beneath, petiolate, the petioles slender, canaliculate, sparsely sericeous at first, up to 1.2 cm. long; leaf blades chartaceous, lanceolate, up to 16 cm. long, 5 cm. wide, apex acuminate, the acumen obtusish, base acute, not revolute, the conspicuous costa shallowly impressed above, elevated beneath, the primary lateral nerves 6–8-pairs, very slender, arcuately ascending and anastomosing near margin, the reticulation fine and open, conspicuously barbate in some axils of primary nerves; inflorescences axillary and subterminal, small, narrowly paniculate, up to 4 cm. long, rather congested, subsessile or with peduncles up to 1 cm. long, minutely and finely gray-pubescent; pedicels slender, 3–5 mm. long; flowers finely pubescent, up to 6 mm. long, 10 mm. in diam., with short tube, the lobes spreading, oblanceolate-elliptic, 5 mm. long, the inner narrower, apex obtuse or rounded, densely papillose-pubescent; stamens small, ser. I & II about 1 mm. long, the anthers subreniform, obscurely emarginate, turning inward and hood-like, pubescent extrorsely, the cells introrse, filling anthers, the filaments rather slender, subequalling anthers, pubescent, ser. III about 1.3 mm. long, erect, the anthers very small. doubtfully functional, half the length of filaments, the glands large, subsessile above base of filaments, equalling filaments; staminodia slender, stipe-like, about 0.8 mm. long, with small triquetrous head, pubescent; gynoecium glabrous, about 1.4 mm. long, the style short, the stigma capitate; fruits ellipsoid, about 1.2 cm. long, 8 mm. in diam., the cupules very shallow, up to 5 mm. diam., with entire margin, the pedicels up to 5 mm. long, expanded apically to 3 mm. in diam.

British Honduras: El Cayo District, 1.5 miles southeast of Round Hole Bank, Chiquibul Forest Reserve, about 1700 ft. alt., in high forest, April 25, 1969, *George R. Proctor 30073* (LL, type, fls.), tree, 15 m. tall, flowers white. Guatemala: Dept. Izabal, Puerto Mendez, on San Felipe Road, in *zapotal*, Sept. 12, 1969, *Elias Contreras 9144* (LL, frts.), tree, 40 ft. high, 6 in. diam., "*laurel.*"

N. cayoana is notable for the small pubescent hooded anthers of ser. I & II, and anthers of ser. III greatly reduced and doubtfully functional. Its small pubescent short pedunculate panicles and large flowers are features which further distinguish the taxon. The relationship is in the *N. Heydeana* Mez & J. D. Smith, *N. longicaudata* (Lundell) Allen group.

Nectandra martinicensis (Jacq.) Mez, Jahrb. Bot. Gart. Berlin 5: 459. 1889. *Laurus martinicensis* Jacq. *Nectandra Matudai* Lundell, Wrightia 1: 149. 1946.

The type of *Nectandra Matudai*, *Eizi Matuda 4522* (LL), collected in Chiapas, Mexico at Malpaso, near Siltepec, alt. 1000 m., July 21, 1941, has been annotated by A. L. Bernardi as *N. martinicensis*, a species apparently new to Mexico.

Nectandra Thornei Lundell, sp. nov. – Arbor parva, ramulis gracilis, minute adpresse griseo-pubescentibus, striatis; folia alternata, membranacea, novella minute sericea, petiolata, petiolo ad 2.5 cm. longo, canaliculato; lamina lanceolata vel oblongo-lanceolata, 8–19 cm. longa, 3–5.5 cm. lata, apice acuminata, acumine obtuso, basi acuta, penninervia, utrinque prominulo-reticulata, nervis lateralibus 6–10-paribus; inflorescentia axillaris vel subterminalis, paniculata, ad 12 cm. longa, longe pedunculata, minute griseo-sericea; pedicelli ad 1.2 cm. longi; flores 5 mm. longi, lobis reflexis, oblongo-ellipticis, 4 mm. longis, apice obtusis, extus glabris, intus dense papilloso-pubescentibus; staminibus ser. I & II crassis, ca. 1.2 mm. longis, antheris papillatis, ser. III ca. 1.4 mm. longis, crassis, papillatis, inconspicue biglandulosis; staminodia nulla; gynoecio glabro, 2.4 mm. longo.

Small tree, the branchlets rather slender, striate, drying blackish, minutely gray-pubescent with appressed hairs; buds gray-sericeous; leaves firmly membranaceous, minutely sericeous at first on both surfaces, glabrous at maturity, petiolate, the petioles slender, up to 2.5 cm. long, canaliculate; leaf blades lanceolate or oblong-lanceolate, widest at about the middle, up to 19 cm. long, 5.5 cm. wide, apex obtusely acuminate or obtuse, base acute, not revolute, the reticulation fine but evident on both surfaces, the costa shallowly impressed above, prominent beneath, the slender primary lateral nerves 6–10-pairs, anastomosing near the margin, not barbate in axils of nerves; inflorescences axillary and subterminal, paniculate, up to 12 cm. long with peduncles up to 4 cm. long, minutely grayish-sericeous; pedicels long and slender, up to 1.2 cm. long; flower buds subglobose, glabrous except at base; flowers 5 mm. long, the tube very short, the lobes spreading, oblong-elliptic, 4 mm. long, obtuse at apex, glabrous outside, densely papillose-pubescent within; stamens of ser. I & II about 1.2 mm. long, thick, papillate, the anthers rounded-ovate, subsessile, the filaments very short and thick, the thick apical connective of anthers incurved, ser. III about 1.4 mm. long, thick, the anthers quadrate, truncate at apex, the filaments thick, shorter than anthers, biglandular at base with small glands, minutely papillate; staminodia none; gynoecium glabrous, deep-seated, 2.4 mm. long, the slender style equalling ovary, the stigma discoid, prominent.

✓ Mexico: Chiapas, ruins of Palenque, 2 miles south of Palenque, elev. about 500 ft., tropical rain forest, June 27, 1970, *Robert F. Thorne & E. Lathrop 40526* (LL, type), small tree.

A very well-marked taxon clearly related to *N. rubriflora* (Mez) Allen, but not to be confused with that species which has much broader leaves, short pedicels, a very short stout style and other floral differences of significance.

Nectandra turbacensis (H.B.K.) Nees, Pl. Laur. Expos. 14. 1833. *Ocotea turbacensis* H.B.K. *Nectandra mopanensis* Lundell, Wrightia 4: 104. 1969.

R. Barneby and Caroline K. Allen annotated an isotype of *Nectandra mopanensis*, referring the collection to *N. turbacensis*. I have not seen authentic material of that taxon described from South America, so I am not in a position to confirm their identification. *N. turbacensis* has not been recorded from the Maya Area. The type of *N. mopanensis* was collected in El Cayo District, British Honduras.

Ocotea barbatula Lundell, sp. nov. — Arbor, ramulis cinereo-sericeis; folia parva, petiolata, petiolo ad 1 cm. longo; lamina chartacea, supra glabra, subtus sericea, areolato-reticulata, anguste oblongo-elliptica vel lanceolata, ad 11.5 cm. longa, 3.8 cm. lata, apice acuminata, basi acuta, nervis 6- vel 7-paribus; inflorescentia axillaris, parva, anguste paniculata, pauciflora, parce sericea, ad 5.5 cm. longa; flores parce sericei, parvi, pedicellis 1.5–3 mm. longis, perianthio subcampanulato, lobis ovatis, 1.5–1.8 mm. longis; staminibus ser. I & II 1.2–1.4 mm. longis, antheris ovatis, apice truncato-rotundatis, ser. III ca. 1.5 mm. longis, filamentis basi biglandulosis, hirtellis; staminodia nulla; ovarium glabrum.

Tree, about 16 m. high, 2 cm. in diam., the leaf buds and slender branchlets densely sericeous with grayish-white hairs; leaves chartaceous, glabrous above, persistently sericeous beneath and with small hairy domatia scattered over blade; petioles short, sometimes up to 1 cm. long, slender, canaliculate; leaf blades chartaceous, narrowly oblong-elliptic or lanceolate, 5.5–11.5 cm. long, 1.3–3.8 cm. wide, apex acuminate with slender obtusish acumen, base acute, midvein prominent beneath, slightly elevated above, primary lateral veins 6- or 7-pairs, rather slender, arcuately ascending and anastomosing rather remote from margin, the lower surface areolate-reticulate, rather smooth above, blackish; inflorescences axillary, small, narrowly paniculate, twice-branched, sparsely sericeous, up to 5.5 cm. long with peduncles up to 2.5 cm. long, few-flowered, the flowers umbellate, usually only 2 or 3 at the ends of branchlets, drying black; pedicels usually 1.5–3 mm. long, rarely up to 4 mm. long; flowers sparsely sericeous, the perianth tube short, not constricted, the lobes thickish, erect, subequal, ovate or ovate-elliptic, 1.5–1.8 mm. long, glabrous within; stamens of two outer series 1.2–1.4 mm. long, the small 4-celled anthers ovate, truncate-rounded at apex, subequalling the thick glabrous filaments; stamens of third series about 1.5 mm. long, with two sessile glands at base, the anthers subequalling filaments, the filaments pubescent at base; staminodia none; ovary glabrous, the style thick, shorter than ovary; stigma lateral.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on top of hill, northwest of km. 159 of Coban Road, June 12, 1975, *C. L. Lundell & Elias Contreras 19444* (LL, type), tree, 50 ft. high, 8 in. diam., flowers yellow-green; same locality, east of km. 154 of Coban Road, June 7, 1975, *Lundell & Contreras 19387* (LL), small tree, 25 ft. high, 3 in. diam., flowers greenish.

Fruiting collections from the same general locality, *Lundell & Contreras 19202* (LL), *19213* (LL), *19223* (LL), have narrowly obconical pedicels up to 8 mm. long, thin shallow cupules 8–9 mm. in diameter, and black ellipsoid fruits 1.2–1.8 cm. long, rounded or truncate-rounded at apex. Also, *Lundell & Contreras 19608* (LL), in flower, is referable here.

O. barbatula has flowers very similar to those of *O. eucymosa* Lundell from the same locality. *O. barbatula*, named for the conspicuous hairy domatia on the lower leaf surface, is a sericeous taxon while *O. eucymosa* is strictly glabrous. *O. eucymosa* differs further in having cymose-paniculate inflorescences subequalling leaves, and stipitiform staminodia. The lateral stigma of *O. barbatula* is noteworthy.

The two taxa appear to be related to *O. Klotzschiana* (Nees) Hemsley of Mexico.

Ocotea Contrerasii Lundell, sp. nov. – Arbor; ramuli graciles; folia parce sericea vel adpresse pubescentia, petiolata, petiolo 7–12 mm. longo, canaliculato; lamina subchartacea, lanceolata vel oblongo-lanceolata, 7.5–17 cm. longa, 2.5–5.5 cm. lata, apice acuminata, basi acuta; inflorescentia axillaris, racemosa; flores adpresse pubescentes, ca. 2.5 mm. longi, pedicellis ca. 6 mm. longis, perianthio late campanulato, lobis late ovatis, ca. 1.8 mm. longis, punctatis; staminibus ser. I & II 1.2–1.4 mm. longis, pubescentibus, antheris filamentis subaequalibus, ser. III ca. 1.6 mm. longis conspicue biglandulosis; staminodiis linearibus pubescentibus ca. 1 mm. longis; gynoecio glabro; fructus ad 4 cm. longus, 1.5 cm. diam.; cupula dentata, ca. 1.5 cm. diam.; pedicelli fructiferi crassi, ad 2 cm. longi.

Tree, about 20 m. tall, 30 cm. diam.; branchlets slender, pubescent; leaves at maturity sparsely sericeous on both surfaces, pilose beneath along the midvein and conspicuously barbate in axils of nerves, petiolate, the petioles 7–12 mm. long; leaf blades thin; bright green, lanceolate or oblong-lanceolate, up to 17 cm. long, 5.5 cm. wide, apex subabruptly acuminate, base acute, midvein elevated beneath, the primary lateral veins mostly 8 pairs, slender and elevated, arcuately ascending, the reticulation inconspicuous; inflorescences axillary, racemose, up to 10 cm. long, pedunculate, few-flowered, pubescent; pedicels about 6 mm. long; perianth shallow, appressed-pubescent; perianth lobes thin, broadly ovate, about 1.8 mm. long, subequal, the inner larger, minutely and densely pellucid-punctate, nearly erect, sericeous within; stamens of ser. I & II 1.2–1.4 mm. long, pubescent, filaments thick, subequalling anthers, the anthers ovate-quadrangular, subtruncate at apex, ser. III 1.6 mm. long, appressed pubescent, the filaments longer than anthers, conspicuously biglandular at base; staminodia slender, stipe-like, 1 mm. long, appressed pubescent; ovary glabrous, the somewhat shorter style narrowly conical; fruits large, oblong-ellipsoid, up to 4 cm. long, 1.6 diam., truncate-rounded at apex; cupule large, about 1.5 cm. in diameter, about 8 mm. long, the margin conspicuously dentate with the persistent perianth lobes; pedicel of fruits large, up to 2 cm. long, about 5 mm. in diameter below cupule.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest, east of km. 162/163, Aug. 9, 1975, *C. L. Lundell & Elias Contreras 19588* (LL, type), tree, 60 ft. high, 12 in. diam., fruit green, *"laurel."*

A very well-marked taxon with probable affinity to *O. Meziana* Allen. The bright green conspicuously veined leaves, small axillary pubescent racemes, pubescent flowers with ovate-quadrangular anthers and slender stipe-like staminodia, combined with the elongated thick fruiting pedicels up to 2 cm. long, large shallow cupules conspicuously dentate on the

margins, and large oblong-ellipsoid fruits are notable features of *O. Contrerasii.*

Ocotea eucymosa Lundell, Wrightia 5: 35. 1974.

Guatemala: Dept. Baja Verapaz, Union Barrios, in high forest on hill, west of km. 154 of Coban Road, April 12, 1975 *C. L. Lundell & Elias Contreras 19174* (LL), tree, 50 ft. high, 10 in. diam., flowers yellow-green; Niño Perdido, in high forest, west of km. 150/151 of Coban Road, Aug. 1975, *Lundell & Contreras 19741* (LL), tree, 80 ft. high, 15 in. diam., fruit green, "*laurel.*"

The fruiting pedicels are narrowly obconical, up to 1 cm. long, the cupule is thin and shallow, 8–10 mm. in diameter, and the fruits are subglobose, up to 1.5 cm. long. In *19741* the leaves are rounded and usually abruptly acutish at base.

Except for the ciliate tender leaves the taxon is strictly glabrous compared with the sericeous *O. barbatula* Lundell of the same area.

Ocotea eusericea Lundell, sp. nov. — Arbor, ramulis juventute sericeo-pubescentibus; folia subverticillata, supra glabra, lucida, subtus sericea, basi revoluta et petiolata; lamina coriacea, anguste oblanceolata, 6.5–12 cm. longa, 2–3 cm. lata, basi cuneatis in petiolum decurrentibus ibique valde recurvatis usque ad 3 cm., apice obtuse et subabrupte subacuminatis, nervis ad 13-paribus, eglandulosis; infructescentia axillaris, anguste paniculata, parce sericea, ad 11 cm. longa, pauciflora, pedunculata; fructus oblongo-ovoideus, ad 3 cm. longus, 1.5 cm. diam.; cupula rubra, margine integra, ad 1 cm. diam., 3–4 mm. longa; pedicelli fructiferi crassi, 1–1.5 cm. longi, apice 3–4 mm. diam.

Tree, 35 m. high, 1 m. diam., the branchlets rather slender, sericeous at first, angulate; leaves subverticillate, lucid above and glabrous except along the costa, finely sericeous beneath, not barbate in axils of nerves, often essentially sessile with blade decurrent and revolute to base, the petiole when present canaliculate and rather slender; leaf blades coriaceous, rather narrowly oblanceolate, up to 12 cm. long, 3 cm. wide, base cuneate, strongly decurrent and revolute, apex subabruptly short acuminate with obtuse acumen, the costa elevated, the primary lateral veins up to 13 pairs, very slender, irregular and arcuately ascending, rather inconspicuous on both surfaces, the reticulation obscure; infructescences rather stout, axillary, narrowly paniculate, sparsely sericeous, up to 11 cm. long, mostly short-pedunculate, few-flowered; fruits glabrous, oblong-ovoid, up to 3 cm. long, 1.5 cm. diam.; cupules red, shallow, rather thin, with entire margin, up to 1 cm. in diam., 3–4 mm. long, sparsely sericeous with age; fruiting pedicels narrowly obconical, thick above, 1–1.5 cm. long, up to 4 mm. in diam. below cupule.

Panama: Chiriqui, along the Quiel road 12.2 km. above Boquete, alt. 5500 ft., in remnant high forest, May 13, 1971, *George R. Proctor 31858* (LL, type), tree, 35 m. high, 1 m. diam., cupules red, fruits green.

Related to *O. Austinii* Allen and *O. irazuensis* Lundell, *O. eusericea* is characterized by gray to brownish sericeous indument, inconspicuously veined narrowly oblanceolate leaves, and very shallow smooth sericeous cupules with entire margin. The revolute elongated base of the leaf

blade is very conspicuous giving a spatulate appearance to some of the leaves.

Ocotea guatemalensis Lundell, sp. nov. – Arbor, ramulis angulatis, crassis, juventute minute sericeo-pubescentibus; folia subverticillata, supra glabra, subtus sericeo-pubescentia, barbata, petiolata, petiolo marginato, 1–1.5 cm. longo; lamina chartacea vel subcoriacea, oblongo-elliptica vel oblanceolato-elliptica, 12–27 cm. longa, 3–8.5 cm. lata, apice obtusa, subacuminata vel rotundata, basi acuta vel rotundata et acutiuscula, costa subtus conspicue elevata, nervis 10–12-paribus; inflorescentia axillaris, minute sericea, paniculata, 5–15 cm. longa, robusta, pedunculata; flores ca. 3 mm. longi, subsessiles, lobis inaequalibus, late ovatis vel oblongo-ovatis, 1.5–2 mm. longis, dense pubescentibus, pellucido-punctatis; staminibus ser. I & II 1.2–1.4 mm. longis, antheris subsessilibus, ser. III ca. 1.5 mm. longis, filamentis crassis, basi biglandulosis; staminodiis nullis; gynoecio glabro, ca. 2 mm. longo.

Tree, up to 20 m. tall, 25 cm. diam.; branchlets thick, angulate, drying black, at first sericeous; leaves subverticillate, glabrous above at maturity, finely sericeous beneath, usually barbate in the axils of primary nerves, petiolate, the petioles rather stout, marginate, up to 1.5 cm. long, usually shorter; leaf blades firmly chartaceous or subcoriaceous, oblong-elliptic or oblanceolate-elliptic, up to 27 cm. long, 8.5 cm. wide, usually quite narrow, apex obtuse, obtusely subacuminate or rounded, base slightly decurrent and acute to rounded and acutish, the costa and primary nerves nearly plane above, elevated beneath, the primary nerves 10–12-pairs, arcuately ascending; inflorescences axillary or subterminal, finely appressed pubescent, paniculate, pedunculate, rather sparingly branched, drying black, 5–15 cm. long; flowers in glomerules at ends of branchlets of inflorescence, finely tomentellous, about 3 mm. long with shallow hypanthium, subsessile or with pedicels up to 2 mm. long, the lobes suberect, unequal, 1.5–2 mm. long, the outer larger, broadly ovate, the inner oblong-ovate, thinner, pellucid-punctate, finely appressed pubescent within; stamens glabrous, ser. I & II 1.2–1.4 mm. long, the filaments thickish, shorter than anthers, the anthers ovate-quadrangular, truncate at apex or obtuse-rounded, ser. III about 1.5 mm. long, the filaments thick, with a pair of sessile glands at base equalling filaments; staminodia absent; gynoecium glabrous, about 2 mm. long.

Guatemala: Dept. Baja Verapaz, Niño Perdido, in high forest on top of hill, east of km. 150/151, Aug. 29–30, 1975, *C. L. Lundell & Elias Contreras 19754* (LL, type), tree, 25 ft. high, 4 in. diam., flowers yellow-green, *"laurel"*; same locality and date, *Lundell & Contreras 19747* (LL), *19766* (LL).

Of apparent affinity to *O. verapazensis* Standl. & Steyerm. of the same general area, the new taxon may be recognized by its stout subsericeous rather than slender glabrous inflorescences, tomentellous usually subsessile glomerate flowers, truncate mostly quadrate anthers, and for the absence of staminodia.

Ocotea irazuensis Lundell, sp. nov. – Arbor 15 m. alta, ramulis crassis, atratus, juventute sericeo-pubescentibus; folia parva, subverticillata, supra glabra, costa exceptis, subtus sericea, petiolata, petiolo

canaliculato, 4–7 mm. longo; lamina coriacea, supra subbullata, elliptica, 4–8 cm. longa, 2–3.5 cm. lata, apice subabrupte subacuminata vel acuta vel obtusa, basi recurvata, costa subtus conspicue elevata, nervis 7- vel 8-paribus; inflorescentia axillaris et subterminalis, anguste paniculata, ad 9 cm. longa, sericea, longipedunculata; flores dense sericei, ca. 4 mm. longi, pedicellati, pedicellis ad 3.2 mm. longis, crassis, perianthio late campanulato, lobis ovatis vel ovato-ellipticis, ca. 3 mm. longis, minute pellucido-punctatis; staminibus ser. I & II ca. 1.75 mm. longis, filamentis antheris subaequalibus, ser. III ca. 2 mm. longis, filamentis crassis, antheris subaequalibus, basi conspicue biglandulosis; staminodiis nullis; gynoecio glabro, ca. 2.8 mm. longo, stigmate conspicuo; fructus oblongo-ellipsoideus, 2.5–3 cm. longus, ca. 1.5 cm. diam.; pedicelli fructiferi crassi, 8–12 mm. longi; cupula 3–6 mm. alta, ad 1.5 cm. lata, subdentata.

Tree, 15 m. tall, the branchlets thick, somewhat angled, drying black, at first finely sericeous; leaves rather small, subverticillate, crowded at apex of branchlets, at maturity glabrous above except along the costa, finely sericeous beneath and sometimes barbate in the axils of the primary nerves; leaf blades rigidly coriaceous, subbullate above with the primary nerves and costa slightly elevated, reticulation evident but not conspicuous, nearly always elliptic, sometimes slightly wider above or below the middle, 4–8 cm. long, 2–3.5 cm. wide, apex abruptly short apiculate-acuminate or acute or obtuse, base conspicuously recurved up to 1 cm. or more below which the petiole is distinct, canaliculate, 4–7 mm. long, blackish, the costa elevated beneath, the primary lateral nerves 7- or 8-pairs, slender, arcuately ascending, the reticulation inconspicuous; inflorescences axillary, mostly subterminal and crowded, narrowly paniculate, up to 9 cm. long, densely and finely sericeous-pubescent, the peduncle elongated, rather stout; flowers terminally glomerate, densely sericeous-pubescent, about 4 mm. long, pedicellate, the pedicels stout, up to 3.5 mm. long, the perianth broadly campanulate, the lobes suberect, rather thin, ovate or ovate-elliptic, about 3 mm. long, acutish, minutely pellucid-punctate; stamens glabrous, ser. I & II about 1.75 mm. long, the anthers ovate-quardrangular, truncate at apex, with cells introrse, the lower much larger than apical, the filaments stout, shorter than anthers, stamens of ser. III about 2 mm. long at anthesis, the lower cells extrorse, the upper lateral, the anthers emarginate-truncate at apex, the stout filaments shorter than anthers, the large basal glands subequalling the filaments; staminodia absent; gynoecium glabrous, about 2.8 cm. long, the stigma large, discoid; infructescences stout, up to 12 cm. long, the fruits oblong-ellipsoid, 2.5–3 cm. long, about 1.5 cm. in diameter; pedicels thick, up to 12 mm. long; cupules shallow, flaring, up to 1.5 cm. wide, the margin dentate or irregular.

Costa Rica: Cartago, slopes of Volcan Irazú, elev. 9,000–10,000 ft., June 15, 1971, *George R. Proctor 32355* (LL, type), tree 15 m. tall, flowers dull greenish, fragrant, fruits green.

There appear to be five closely related cloud-forest species in Costa Rica and Panama. These are *O. irazuensis*, which grows at the highest elevation, *O. Austinii* Allen, *O. Endresiana* Mez, *O. Tonduzii* Standl., and *O. Skutchii* Allen. From description, *O. irazuensis* appears to be nearest *O. Austinii* differing in its inconspicuous leaf reticulation, short petioles,

and pubescence which is not ferruginous.

Dr. George R. Proctor is one of the most able field botanists as well as taxonomists of our generation, for his specimens are always carefully selected, as evidenced by the type collection of *O. irazuensis* which has inflorescences in various stages of development including flowers at anthesis, and infructescences with essentially mature fruits, all on the same branchlets, all well preserved.

Ocotea magnifolia (Lundell) Lundell, comb. nov. *Nectandra magnifolia* Lundell, Wrightia 4: 103. 1969.

Described from Chahal in the Department of Alta Verapaz, Guatemala, *Elias Contreras 7865* (LL, type), two additional Guatemalan collections of the species, both in young fruit, are now available: *Contreras 9393* (LL), *9425* (LL), from the Department of Peten, Los Arcos, km. 165 of the Cadenas Road, Dec. 18–20, 1969.

Ocotea nigrita (Lundell) Lundell, comb. nov. *Nectandra nigrita* Lundell, Wrightia 4: 132. 1970.

Guatemala: Dept. Izabal, El Estor, in high forest, Mar. 20, 1972, *Elias Contreras 11419* (LL), tree, 50 ft. high, 12 in. diam., flowers yellowish; same locality and date, *Contreras 11420* (LL), tree, 70 ft. high, 18 in. diam., flowers yellowish; Cadenas, on Arenales Road, in high forest, *zapotal*, about 5 km. west of the village, Feb. 16, 1975, *C. L. Lundell & Contreras 18984* (LL), tree, 100 ft. high, 30 in. diam., flowers creamish-white, aromatic, *"laurel."*

Known previously only from *Contreras 9465* (LL, type), and *Contreras 9424* (LL), both collections from the Department of Peten.

Ocotea venosissima (Lundell) Lundell, comb. nov. *Nectandra venosissima* Lundell, Wrightia 4: 106. 1969.

Phoebe Breedlovei Lundell, sp. nov. – Arbor, ramulis crassis, tomentellis, angulatis; folia subverticillata, petiolata, petiolo canaliculato, usque ad 4 cm. longo; lamina subcoriacea, novella utrinque minute tomentella, mox supra glabra subtus pubescentia, elliptica, 9–18 cm. longa, 5–9 cm. lata, apice obtusa vel subacuminata, acumine obtuso, basi acuta vel rotundata et acutiuscula, triplinervia, costa supra impressa pubescente subtus elevata, nervis lateralibus 3–5-paribus; inflorescentia axillaris et subterminalis cymoso-paniculata, ad 20 cm. longa, parce pubescentia, multiflora, pedunculata; flores 3–3.5 mm. longi, pedicellis ad 6.5 mm. longis, gracilibus, lobis ovatis, ca. 2.2 mm. longis, obtusis; staminibus ser. I & II ca. 1.75 mm. longis, antheris oblongis, filamentis crassis longioribus, ser. III ca. 1.5 mm. longis, biglandulosis, antheris anguste oblongis; staminodiis ca. 1 mm. longis, ovatis, acutis, crassistipitatis basi adpresse pubescentibus; gynoecio glabro, 2.2 mm. longo, ovario subgloboso stylo aequali, stigmate conspicuo; fructus ellipsoideus, ca. 2 cm. longus, 1 cm. diam.; cupula dentata, ca. 8 mm. lata, 2–3 mm. longa; pedicelli fructiferi 5–7 mm. longi, crassi.

Tree, 10 to 16 m. tall, the branchlets stout, gray-tomentellous at first, glabrous and drying black below apex, angulate; leaves subverticillate, petiolate, the petioles up to 4 cm. long, blackish, tomentellous at first;

leaf blades firm, subcoriaceous, shining above at maturity, at first minutely tomentellous on both surfaces, the tomentum persistent beneath, elliptic or rarely oblongish, up to 18 cm. long, 9 cm. wide, the apex obtuse or obtusely short acuminate, base acute or rounded and acutish, triplinerved, the costa and nerves shallowly impressed above, elevated beneath, the primary lateral nerves 3–5-pairs, barbate in the axils; inflorescences axillary and subterminal, cymose-paniculate, up to 20 cm. long and equalling or exceeding the leaves, pedunculate, slender-branched, multiflowered, rather sparsely and finely pubescent; flowers up to 3.5 mm. long, in open cymes with the pedicel of central flower elongated, up to 6.5 mm. long, slender, the flowers finely but rather sparsely appressed pubescent; hypanthium short, the perianth lobes erect, thin, ovate, about 2.2 mm. long, obtusish; stamens of ser. I & II about 1.75 mm. long, slender, the anthers oblong, with introrse cells, the filaments longer than anthers, ser. III about 1.5 mm. long, linear-oblong, biglandular at base; staminodia well developed, about 1 mm. long, ovate, acutish, with thick pubescent stipe; gynoecium glabrous, about 2.2 mm. long, the slender style equalling the subglobose ovary, the stigma discoid; fruits ellipsoid, up to 2 cm. long, 1 cm. in diam.; cupule shallow, about 8 mm. in diam., 2–3 mm. long, with dentate margin; fruiting pedicel obconical, up to 7 mm. long, thick.

Mexico: Chiapas, Municipio of Pueblo Nuevo Solistahuacan, steep slope with *Quercus, Pinus, Liquidambar, Podocarpus* and *Magnolia* along the ridge above Pueblo Nuevo Solistahuacan, elev. 6500 ft., Aug. 15, 1967, *Alush Shilom Ton 2812* (LL, type, fls.), tree 30 ft. tall; same locality, April 3, 1968, *Ton 3916* (LL, fruits), tree 50 ft. tall; Municipio of Rayon, steep moist slope near Puerto del Viento, 9 miles northwest of Pueblo Nuevo Solistahuacan along road to Tapeula, elev. 6100 ft., Aug. 20, 1965, *D. E. Breedlove 11975* (LL, fls.), tree 30 ft. tall.

The relationship of *P. Breedlovei* appears nearest *P. mexicana* Meissn., but it differs strikingly from that taxon in its large branched inflorescences with flowers cymose, larger wider leaves persistently and closely tomentellous on lower surface, and in having fruits twice as large.

Phoebe corzoana (Lundell) Lundell, comb. nov. *Nectandra corzoana* Lundell, Wrightia 4: 103. 1969.

Phoebe fruticosa Lundell, sp. nov. — Fruticosa, ca. 1 m. alta, ramulis gracilis, angulatis, minute sericeo-pubescentibus; folia alternata, juvente minute adpresse pubescentia, petiolata, petiolo 4–8 mm. longo; lamina chartacea vel subcoriacea, subtriplinervia, barbata, lanceolata, 3.5–8.5 cm. longa, 1.5–3 cm. lata, apice acuminata, acumine obtusiusculo, basi rotundata vel acutiuscula, nervis lateralibus 3–5-paribus, subtus leviter elevatis; inflorescentia axillaris et subterminalis, anguste paniculata, 1.3–3.5 cm. longa, pedunculata, pauciflora, minute et parce adpresse pubescentia; flores subglabri, ad 2.8 mm. longi, brevipedicellati, pedicellis 2–2.5 mm. longis gracilibus, perianthio campanulato, lobis ovatis, acutis, membranaceis, ca. 2.4 mm. longis; staminibus ser. I & II 1.3–1.4 mm. longis, antheris ovatis, obtusis, ser. III ca. 1.5 mm. longis, biglandulosis, antheris oblongis; staminodiis ovato-cordatis, crassis, 0.8–1

mm. longis, brevistipitatis, basi pubescentibus; gynoecio glabro, stigmate conspicuo.

Evidently a shrub, about 1 m. tall, the branchlets very slender, angulate, minutely appressed-pubescent; leaves glabrous at maturity except for the barbate axils of the primary nerves on lower surface, subtriplinerved, petiolate, the petioles slender, up to 8 mm. long; leaf blades firm, chartaceous or subchartaceous, nearly smooth above with subimpressed costa and nerves, reticulate beneath, lanceolate, up to 8.5 cm. long, 3 cm. wide; apex with obtusish acumen, base rounded and usually acutish, the primary lateral nerves slender, 3–5-pairs, arcuately ascending; inflorescences small, narrowly paniculate, minutely and sparsely appressed pubescent, up to 3.5 cm. long, shorter than leaves, with long peduncles; flowers almost glabrous, up to 2.8 mm. long, the pedicels slender, up to 2.5 mm. long, the perianth lobes thin, ovate, about 2.4 mm. long, acutish; stamens of ser. I & II up to 1.4 mm. long, the obtuse ovate anthers longer than filaments, ser. III slightly longer, biglandular at base with glands equalling filaments, the anthers oblong, slender; staminodia ovate-cordate, up to 1 mm. long, with thick pubescent stipe; gynoecium glabrous, about 1.8 mm. long, with style subequalling ovary, the prominent stigma discoid.

Mexico: Chiapas, Municipio of Tuxtla Gutierrez, steep slope at El Sumidero, 22 km. north of Tuxtla Gutierrez, elev. 4500 ft., July 2, 1965, *D. E. Breedlove 10671* (LL, type), 3 ft. tall.

P. fruticosa belongs in the *P. Barbeyana* Mez, *P. salicifolia* Nees group of closely related species of Mexico, all of which are poorly known. Leaves of *P. fruticosa* are rather obscurely triplinerved and essentially smooth above.

Phoebe parvula Lundell, sp. nov. – Arbor, ramulis tenuis, minute subsericeo-pubescentibus; folia alternata, parvissima, petiolata, petiolo 3–5 mm. longo, canaliculato; lamina chartacea, lanceolata, 3–6 cm. longa, 1–2.2 cm. lata, apice caudato-acuminata, basi acuta, novella parce sericea, penninervia, nervis 3- vel 4-paribus, barbatis; inflorescentia anguste paniculata, subsericeo-pubescentia, parva, gracilis, axillaris vel subterminalis, ad 5 cm. longa; pedicelli 2–3 mm. longi; flores subglabri, ca. 3 mm. longi, lobis oblongis vel elliptico-oblongis, ca. 2.2 mm. longis, apice obtusis, pellucido-punctatis, apice papillosis; staminibus ser. I & II ca. 1.2 mm. longis, antheris filamentis aequalibus, ser. III ca. 1.5 mm. longis, antheris filamentis aequalibus, conspicue biglandulosis; staminodiis ca. 0.8 mm. longis; gynoecio glabro, ca. 1.8 mm. longo, stigmate conspicuo.

Tree, about 6 m. tall, the branchlets very slender, finely pubescent, with the terminal buds and tender leaves gray-sericeous; leaves alternate, very small, petiolate, the petioles slender, 3–5 mm. long, canaliculate, subsericeous; leaf blades chartaceous, drying blackish, at maturity shiny and glabrous above except along the shallowly sulcate costa, glabrous beneath except for a few scattered appressed hairs and the conspicuously barbate axils of the primary nerves, the venation obscure, the blades lanceolate, 3–6 cm. long, 1–2.2 cm. wide, apex long acuminate, base acute, penninerved, the costa elevated beneath, the primary lateral nerves 3- or

4-pairs, slender, arcuately ascending; inflorescences axillary and subterminal, narrowly paniculate, very slender, bracteate, up to 5 cm. long, finely subsericeous-pubescent; pedicels slender, pubescent, 2–3 mm. long at anthesis; flowers essentially glabrous, with short tube, about 3 mm. long, the perianth lobes thin, spreading, oblong or elliptic-oblong, 2–2.2 mm. long, apex obtuse-rounded and papillate, pellucid-punctate; stamens of ser. I & II glabrous, about 1.2 mm. long, the slender filaments equalling the oval anthers, the anthers truncate-rounded at apex, ser. III about 1.5 mm. long, with a pair of large stipitate glands at base; staminodia slender, about 0.8 mm. long, triquetrous and acute apically, the stipe hairy at base; gynoecium glabrous, about 1.8 mm. long, the stout style subequalling ovary, the stigma discoid.

Mexico: Chiapas, Municipio of Tenejapa, slope with *Pinus*, *Quercus* and *Liquidambar* in Paraje Shohleh, elev. 8400 ft., Jan. 12, 1966, *Alush Shilom Ton 605* (LL, type), tree 20 ft. tall.

The relationship of *P. parvula* seems to be near *P. psychotrioides* (H.B.K.) Mez, but the strictly lanceolate caudate-acuminate leaves with only 3 or 4 pairs of lateral nerves conspicuously barbate in the axils together with the glabrous flowers are features distinguishing *P. parvula*.

Phoebe salvadorensis (Lundell) Lundell, comb. nov. *Nectandra salvadorensis* Lundell, Wrightia 4: 105. 1969.

Pleurothyrium glandulosum (Lundell) Lundell, comb. nov. *Nectandra glandulosa* Lundell, Wrightia 1: 148. 1946.

Pleurothyrium, a South American genus, new to the flora of Mexico and Central America, is characterized by having all nine stamens glandular at base, as well as distinctive anthers. The species is known only from the type: *Eizi Matuda 5934* (LL), collected in Chiapas, Mexico at Montecristo, alt. 1350 m., June 17, 1945.

LEGUMINOSAE

Bauhinia petenensis Lundell, sp. nov. – Frutex vel arbor parva; ramuli graciles, glabri; folia petiolata, petiolo ad 4 cm. longo; lamina membranacea, supra glabra, subtus minute adpresse puberula, ovata, 4–10 cm. longa, 4.5–9.5 cm. lata, basi subcordata apice biloba, lobis apice rotundatis; racemi adpresse puberuli, simplices vel paniculati, pedunculati; pedicelli ad 1 cm. longi; calyx ca. 2 cm. longus, tubulosus; petala 5, longe unguiculata, subspathulata; stamina 10; unum fertile antheriferum, liberum; novum sterilia; ovarium albohirsutum; legumen linearioblongum, minute adpresse puberulum.

Shrub or slender tree, about 6 m. tall, the branchlets very slender, glabrous or nearly so; leaves on slender petioles 2–4 cm. long; leaf blades ovate, bilobed, sometimes to middle or below, 4–10 cm. long, 4.5–9.5 cm. wide, shallowly and widely cordate at base or subtruncate, the lobes ovate-deltoid or oblongish, rounded at apex, the blades 7-nerved, membranaceous, finely reticulate, paler beneath and densely puberulent with minute appressed hairs, glabrous above; inflorescences and flower buds puberulent with minute appressed hairs, the buds densely so, the racemes

slender, simple or in small panicles, either terminal or lateral on old wood, flowers rather crowded at apex of racemes, the slender pedicels up to 1 cm. long; calyx reddish, very slender, up to 2 cm. long in bud, the apex acutish and apiculate; petals 5, the blades very narrow, long-unguiculate, sparsely pilose; fertile stamen 1, the 9 sterile ones much reduced; ovary appressed-pubescent with white hairs; legume minutely appressed-puberulent, linear-oblong, up to 12 cm. long, 1.5 cm. wide, tapering into long basal stipe, acicular at apex.

Guatemala: Dept. Peten, Dos Lagunas, in *zapotal* 1 km. north of village, Dec. 30, 1976, *C. L. Lundell & Elias Contreras 20475* (LL, type), shrub, 15 ft. high, 3 in. diam. corolla pink, *"pata de vaca"*; Dos Lagunas, in *ramonal* bordering the North Lake, Nov. 28, 1960, *Contreras 1660* (LL), arborescent shrub, 2 in. diam., 20 ft. high, flowers reddish.

Referable to the *Casparea* group, *B. petenensis* is near *B. Jenningsii* P. Wilson, differing at once from that taxon in having deeply bilobed 7-nerved leaves usually subcordate at base. Leaves of both species are very pale beneath and densely puberulent with minute appressed hairs. Leaves of *B. Jenningsii* are entire, 5-nerved and truncate at base.

LeCointea Tango (Standl.) Luiz Emygdio & Andrade, Biota Amazonica: Botanica 4: 165. 1967. *Zollernia Tango* Standl., Trop. Woods 19: 6. 1929. *Beliceodendron Tango* (Standl.) Lundell, Wrightia 5: 187. 1975. *LeCointea Tango* (Standl.) Yakovl., Bot. Zhurn. 61: 1308. 1976.

The genus *LeCointea* was described by Ducke in 1922 (Arch. Jard. Bot. R. Jan. 8: 128–130). It appears to be represented by three or four South American species, and *L. Tango* of Honduras, British Honduras and Guatemala.

To clarify the status of the genus *Beliceodendron* Lundell (Wrightia 5: 186. 1975), flowering and fruiting material of *B. Tango* was sent to Richard S. Cowan and separately to R. M. Polhill. Both agree as to the reference of the tree to *LeCointea*.

LeCointea joins *Vatairea* and *Pleurothyrium* among the various South American genera found by recent workers to extend northward into Central America and Mexico.

EUPHORBIACEAE

Sapium Bourgeaui Croizat, Jour. Arn. Arb. 24: 172. 1943.

Guatemala: Dept. Peten, Tikal, in second growth bordering the airfield, Jan. 20, 1962, *C. L. Lundell 17206* (A, LL), small tree.

In this Tikal collection of sterile leafy twigs, from vigorous new growth, the leaves are up to 25 cm. long, 6.5 cm. wide, with crenulate margin and unguliform apex. The 12–20 pairs of primary lateral nerves arcuately ascend and anastomose near the margin. Except for the larger size of leaves and the more attenuate usually decurrent base, *Lundell 17206* appears to be referable to *S. Bourgeaui* of southern Mexico. The stipitate glands are lower on the petiole at the base of the decurrent leaf blade.

The type of *S. Bourgeaui*, likewise sterile, has been studied, and the species appears to be distinct, although still not known from fertile material.

Sapium izabalense Lundell, sp. nov. — Arbor glabra, ramulis crassiusculis; folia nitida, petiolata, petiolo ad 4 cm. longo, canaliculato, apice stipitato-biglanduloso; lamina membranacea, lanceolata, 7–18 cm. longa, 3–6 cm. lata, subintegra, apice acuta vel subacuminata, unguliformia, basi late acutiuscula; nervis ad 18-jugis; spicae terminales; fructu tantum viso, pedicellato, pedicello 5–7 mm. longo; columella 8–10 mm. longa, semine arillo coccineo, 5–7 mm. longo, ca. 5 mm. lato.

Tree, branchlets rather slender; leaves papyraceous, shiny on lower surface, petiolate, the petioles slender, canaliculate, up to 4 cm. long, bearing two conspicuous stipitate glands at apex up to 2 mm. long; leaf blades thin, membranaceous, lanceolate, usually widest below middle, up to 18 cm. long, 6 cm. wide, the margin obscurely and very shallowly crenate, subentire, with occasional mammose glands along edges, the apex acute or subacuminate, reflexed, ungulate and glandular, base broad and acutish, the primary lateral veins rather uniformly spaced, very slender, widely and arcuately ascending, not anastomosing, evident but less conspicuous on upper surface, the costa elevated beneath, shallowly sulcate above; fruiting racemes stout, terminal, solitary, pedunculate, with 3–5 rather remote fruits; fruiting pedicels stout, 5–7 mm. long; capsules about 1 cm. long, the columella 8–10 mm. long; seeds smooth, ellipsoid, 5–7 mm. long, up to 5 mm. wide, with red aril.

Guatemala: Dept. Izabal, El Estor, bordering Lake Izabal, in clearing 4 km. east of town, Jan. 26, 1975, *C. L. Lundell & Elias Contreras 18864* (LL, type), tree; between Puerto Mendez (Cadenas) and Rio Dulce, in *zapotal*, km. 187 of highway, Sept. 10, 1976, *Lundell & Contreras 20327* (LL), tree, 40 ft. high, 6 in. diam., laticiferous, "*canilla de chombo.*"

In certain aspects *S. izabalense* resembles *S. Schippii*, under which taxon the two are discussed. The presence of occasional mammose glands on the leaf margin is a feature of note.

Sapium itzanum Lundell, Wrightia 5: 77. 1975.

Guatemala: Dept. Peten, Lake Peten Itza, Santa Elena, km. 1 of road, in clearing, Sept. 9, 1966, *Elias Contreras 6051* (LL, type), tree 70 ft. high, 20 in. diam. Dept. Alta Verapaz, Rubelsanto, in high forest, *zapotal*, between Pozo no. 4 and Laguneta Los Lagartos, July 29, 1975, *C. L. Lundell & Elias Contreras 19578* (LL), tree, 50 ft. high, 12 in. diam., fruit green, "*canilla de chombo.*"

The second collection of the species, in young fruit, has the same small obovate leaves, cuneate at base, as in the type. Its leaf venation of finer, fewer and not uniformly spaced veins, with intermediaries, markedly differs from that of *S. Schippii* Croizat.

Sapium jamaicense Sw., Adnot. Bot. 6. 1829.

Guatemala: Dept. Peten, La Cumbre, on Pusila Road, in high forest on top of hill, 5 km. north, Aug. 19, 1976, *C. L. Lundell & Elias Contreras 20235* (LL), tree, 60 ft. tall, 15 in. diam., laticiferous, "*canilla de chombo*"; La Cumbre, km. 151 of San Luis-Cadenas Road, in *zapotal*, Sept. 11, 1976, *Lundell & Contreras 20339* (LL), tree, 50 ft. tall, 10 in. diam., laticiferous.

A collection of *S. jamaicense* from Clarendon Parish, Jamaica, *Geo.*

R. Proctor 26334 (LL), has leaves with distinct petiolar glands which can not be distinguished from the Peten collections. After reviewing a series of West Indian collections, I see no significant differences for recognizing either *S. pleiostachys* Schumann & Pittier or *S. anadenum* Pittier from *S. jamaicense*. The differences considered by Jablonski (Phytologia 16: 401. 1968) in recognizing the continental *S. pleiostachys* do not hold up on examination of the collections now available.

Sapium nitidum (Monachino) Lundell, Am. Midl. Nat. 29: 477. 1943. *Sapium biglandulosum* var. *nitidum* Monachino, Bull. Torrey Bot. Club 67: 771. 1920. *Sapium mammosum* Lundell, Wrightia 5: 77. 1975.

British Honduras: El Cayo District, Camp 6, on hillside, May 9, 1938, *Percy H. Gentle 2590* (LL), tree, 8 in. diam.; on deep river alluvium, Santa Rosa pasture, 2 miles from El Cayo, elev. 65 m., 1940, *J. B. Kinlock 340* (NY, 2 holotypes); north of the Belize River at Baking Pot, alt. ca. 250 ft., wooded alluvial banks, May 1, 1969, *George R. Proctor 30211* (LL, type of *S. mammosum*), small tree with white latex.

Guatemala: Dept. Peten, Fallabon-Yaxha road, in forest, March 22, 1933, *C. L. Lundell 2192* (MICH), a small tree about 8 m. high; San Luis, south on Cadenas Road, in second growth rain forest, July 12, 1959, *Lundell 16357*, (LL), shrub, 12 ft. high, *"ucan"*; Dolores, on Sto. Toribio trail about 400 m. NW, in high forest, June 7, 1961, *Elias Contreras 2436* (LL), small tree; Cadenas in high forest, km. 169 of road, Mar. 19, 1967, *Contreras 6784* (LL), tree, 40 ft. high, *"cania de chombo"*; Cadenas in high forest bordering Rio Sarstun Mar. 19, 1967, *Contreras 6790* (LL), tree, *"canilla de chombo."* Dept. Izabal, El Estor, in high forest, on El Boqueron, bordering Rio Sause, May 24, 1975, *Lundell & Contreras 19344* (LL), tree, 70 ft. high, *"canilla de chombo."* Dept. Alta Verapaz, Sebol, in high forest, corral, April 17, 1964, *Contreras 4392* (LL), tree; Sebol, in high forest bordering Rio Sebol, SW, Apr. 30, 1964, *Contreras 4554* (LL), tree.

Apparently differing only in larger leaf size with more numerous lateral veins, *S. mammosum* is reduced to synonymy. I have seen the two holotypes at New York with which the type of *S. mammosum* has been compared. The relationship of this taxon to *S. lateriflorum* Hemsl. still is questionable, and the status of *S. nitidum* must await a study of the Hemsley type *(Rovirosa 769)* from Tabasco.

The bilobed stigma, small short-pedicelled fruits, and shiny thin leaves with rather inconspicuous basal glands make *S. nitidum* easy of recognition in this difficult genus.

Sapium Schippii Croizat in Lundell, Am. Midl. Nat. 29: 477. 1943.

British Honduras: Toledo District, Forest Home, Punta Gorda, alt. 250 ft., Sept. 28, 1932, *W. A. Schipp 1049* (A, type), tall tree, 60 ft. high, 18 in. diam. with straight grey smooth barked trunk.

Guatemala: Dept. Peten, La Cumbre, in the village clearing, June 30, 1975, *C. L. Lundell & Elias Contreras 19478* (A, LL), tree, 50 ft. high, 10 in. diam., staminate flowers green, *"canilla de chombo."*

In his synopsis of Caribbean Sapium, (Phytologia 16: 393–434. 1968), Jablonski reduced *S. Schippii* to synonymy under *S. oligoneurum* Schu-

mann & Pittier (l.c., p. 405). The elevated more numerous uniformly spaced arcuate primary veins of the lower surface of the leaves of *S. Schippii* are very distinctive. This taxon is not to be confused with the Schumann and Pittier species. The recent collection in Peten has small elliptic leaves identical to those of the type of *S. Schippii*. The relationship of *S. Schippii* and *S. izabalense* Lundell is close, the latter having much larger narrowly lanceolate leaves almost always wider below the middle and of similar paper texture.

Jablonski (l.c.) stressed in his keys and with illustrations the importance of leaf shape, size and venation in the recognition of taxa in this genus of weak characters.

The staminate terminal spikes of *S. Schippii (Lundell & Contreras 19478)* are up to 20 cm. long with numerous flowers in the clusters, while clusters of *S. oligoneurum* are described as 5- to 7-flowered by Pittier.

Tetrorchidium brevifolium Standl. & Steyerm., Field Mus. Bot. 23: 126. 1944. *Sapium guatemalense* Lundell, Wrightia 5: 76. 1975.

Guatemala: Dept. Alta Verapaz, Rubelpec, in virgin forest, *C. L. Wilson 188* (F, type; type photo of *T. brevifolium*). Dept. Baja Verapaz, Chilasco, in high forest on rocky hill, Tierra Caliente, 15 km., Aug. 3, 1971, *Elias Contreras 10944* (LL), tree, 70 ft. high, 18 in. diam., fruit capsular, "*cafeto*"; Union Barrios, in high forest on top of hill, Mar. 10, 1972, *Contreras 11221* (LL), shrub, 15 ft. high, 4 in. diam.; same locality, Mar. 15, 1972, *Contreras 11335* (LL), tree, 70 ft. high, 15 in. diam.; Union Barrios, on Salama-Coban Road, in high forest on hill, north of km. 148/149, Feb. 7, 1975, *C. L. Lundell & Elias Contreras 18950* (LL), shrub, 20 ft. high, 3 in. diam., flowers green; Union Barrios in high forest on top of hill, on Coban-Salama Road, 3 km. west, Feb. 8, 1975, *Lundell & Contreras 18961* (LL, type of *S. quatemalense*), tree, 40 ft. high, 8 in. diam., fruit green; Union Barrios, in high forest, north 2 km., Feb. 9, 1975, *Lundell & Contreras 18976* (LL), tree, 40 ft. high, 10 in. diam., flowers greenish; Union Barrios, west of km. 154 of Coban Road, April 12, 1975, *Lundell & Contreras 19173* (LL), tree, 65 ft. high, 12 in. diam., fruit green; Niño Perdido, on Cerro Verde, east of km. 150 of Coban Road, in high forest, Dec. 3, 1976, *Lundell & Contreras 20416* (LL), tree, 40 ft. high, 8 in. diam., flowers greenish.

Tetrorchidium brevifolium has been known only from the type, a staminate plant.

GUTTIFERAE

Clusia verapazensis Lundell, sp. nov. – Arbor, ca. 12 m. alta, 25 cm. diam., glabra, ramulis crassis; folia glabra, breviter petiolata, petiolo crasso, alato, 0.5–1.5 cm. longo; lamina coriacea, obovato-rotundata, ad 16 cm. longa, 10.5 cm. lata, apice late rotundata, basi angustato-rotundata; costa subtus elevata, venis lateralibus utrinque prominulis; inflorescentia capitata, pedunculata, pedunculo crasso, 0.5–2 cm. longo; flores feminei 3–5, sessiles; sepala 4; petala 5, ad 1.5 cm. longa; ovarium 5-loculare.

Tree, 35 ft. tall, 10 in. diam., entirely glabrous, the branchlets thick,

the decussately opposite leaves unequal in size; leaves thick, rigidly coriaceous, with short wide petioles 0.5–1.5 cm. long; leaf blades suborbicular or obovate-rounded, up to 16 cm. long, 10.5 cm. wide, broadly rounded at apex, rounded but somewhat narrowed at base and decurrent on the board petiole, the costa sharply elevated beneath, nearly plane above, the lateral veins slender but evident on both surfaces, numerous, up to 30 or more pairs in larger leaves, with evident submarginal vein; pistillate inflorescence capitate, the peduncle thick, short, 0.5–2 cm. long, bibracteate at middle, the bracts oblong-oblanceolate, 1.2–2.5 cm. long, the blade of bracts up to 1 cm. wide, rounded at apex; pistillate flowers 3–5 in the heads, sessile, with 2 thick carinate depressed-ovate bracts 5 mm. long at base of calyx; sepals 4, not carinate, depressed-ovate, 6–7 mm. long, 10–12 mm. wide, broadly rounded at apex, the outer smaller; petals 5, thinner than the thick sepals, broadly ovate-elliptic or obovate-elliptic, up to 1.5 cm. long, rounded at apex; ovary 5-celled, crowned by 5 thick protruding stigmas, the stigmas obscurely muriculate.

Guatemala: Dept. Baja Verapaz, Niño Perdido, on Cerro Verde in high forest on hillside, east of km. 150 of Coban Road, Dec. 3, 1976, *C. L. Lundell & Elias Contreras 20432* (LL, type), tree 35 ft. tall, 10 in. diam., with yellow latex, "*chaparro.*"

Of the broad-petioled group to which *C. verapazensis* belongs, *C. Schippii* Lundell probably is closest. The latter has obovate narrower leaves and ovary 6-celled.

MYRSINACEAE

Microconomorpha (Mez) Lundell, gen. nov. *Conomorpha* A.DC., subgen. *Microconomorpha* Mez, Pflanzenreich IV. 236: 251. 1902.

Microconomorpha Jelskii (Mez) Lundell, comb. nov. *Conomorpha Jelskii* Mez, Pflanzenreich IV. 236: 251. 1902.

This is the first taxon treated by Mez under his new subgenus *Microconomorpha*, and it is taken as the type species of the genus *Microconomorpha*.

Microconomorpha perseoides (Mez) Lundell, comb. nov. *Conomorpha perseoides* Mez, Pflanzenreich IV. 236: 252. 1902.

Microconomorpha pastensis (Mez) Lundell, comb. nov. *Conomorpha pastensis* Mez, Pflanzenreich IV. 236: 252. 1902.

Microconomorpha verticillata (C. Presl) Lundell, comb. nov. *Myrsine verticillata* C. Presl, Rel. Haenke II. 64. 1835. *Conomorpha verticillata* (C. Presl) Mez, Pflanzenreich IV. 236: 252. 1902.

Microconomorpha dentata (Mez) Lundell, comb. nov. *Conomorpha dentata* Mez, Pflanzenreich IV. 236: 252. 1902.

Microconomorpha quercifolia (Mez) Lundell, comb. nov. *Conomorpha quercifolia* Mez, Pflanzenreich IV. 236: 253. 1902.

Microconomorpha panamensis (Lundell) Lundell, comb. nov. *Conomorpha panamensis* Lundell, Wrightia 5: 290. 1976.

SAPOTACEAE

Achras lobulata (Lundell) Lundell, comb. nov. *Manilkariopsis lobulata* Lundell, Wrightia 5: 253. 1976.

Although I shall continue to recognize *Manilkariopsis* as a segregate genus, it is so closely related to *Achras*, differing primarily in the apical segmentation of the corolla lobes, few now working in the Sapotaceae are likely to give it such status. The species are transferred to *Achras*, consistent with my treatment of other taxa in this category.

Achras mayana (Lundell) Lundell, comb. nov. *Pouteria mayana* Lundell, Wrightia 5: 100. 1975.

The species is known from two fruiting collections. Without flowers its relationship is doubtful, but the seed indicate that the taxon is an *Achras* or belongs in a genus of that affinity, rather than *Pouteria*. Its leaves and fruits are very distinctive.

Achras petenensis (Lundell) Lundell, comb. nov. *Manilkariopsis petenensis* Lundell, Wrightia 5: 172. 1975.

Bumelia lenticellata (Lundell) Lundell, comb. nov. *Dipholis lenticellata* Lundell, Wrightia 5: 319. 1976.

Although I favor the recognition of narrow genera segregated on a regional basis, whenever there are morphological characteristics by which they can be sustained, I find no consistent differences for separating *Bumelia* and *Dipholis*. The presence or absence of endosperm, used by some authors to separate the two genera, is often difficult to determine even when collections of fruiting material are available, a rarity.

Paralabatia belizensis (Lundell) Lundell, comb. nov. *Peteniodendron belizense* Lundell, Wrightia 5: 254. 1976.

I shall continue to recognize *Peteniodendron* as a valid genus primarily on the basis of the complete suppression of the stamens and the reduction of the staminodia in the pistillate flowers of *P. belizense*, the type species. Some workers in the Sapotaceae recognize the number of locules in the ovary as more significant, a doubtful distinction. Since the species of *Peteniodendron* have 1 to 3 locules, as in *Paralabatia*, I make these transfers not out of conviction, but rather as an accommodation.

Paralabatia estoriensis (Lundell) Lundell, comb. nov. *Pouteria estoriensis* Lundell, Wrightia 5: 181. 1975. *Peteniodendron estoriense* (Lundell) Lundell, Wrightia 5: 320. 1976.

Paralabatia Lundellii (Standl.) Lundell, comb. nov. *Sideroxylon Lundellii* Standl., Publ. Carnegie Inst. Wash. 461. 79. 1935. *Pouteria Lundellii* (Standl.) L. Wms., Fieldiana, Bot. 31: 264. 1967. *Peteniodendron Lundellii* (Standl.) Lundell, Wrightia 5: 320. 1976.

Paralabatia potosina (Lundell) Lundell, comb. nov. *Pouteria potosina* Lundell, Wrightia 5: 101. 1975. *Peteniodendron potosinum* (Lundell) Lundell, Wrightia 5: 255. 1976.

ASCLEPIADACEAE

Cynanchum eulaxiflorum Lundell, sp. nov. – Herbae volubiles, glabrae; folia longe petiolata, lanceolata, ad 6 cm. longa, 2.3 cm. lata, apice acuminata, basi rotundata; inflorescentia glabra, ad 4.5 cm. longa, eulaxiflora, multiflora; calyx 5-lobatum, lobi usque ad 1 mm. longi; corolla profunde divisa, lobi anguste oblongo-elliptici vel lanceolati, extus glabri, intus minute puberuli; lobi coronae anguste lanceolatae; gynostegium substipitatum.

Slender glabrous vine with elongated internodes, the stems striate; leaves glabrous, with slender petioles 1–1.5 cm. long; leaf blades chartaceous, paler beneath, lanceolate, 3–6 cm. long, 1–2.3 cm. wide, apex acuminate, base rounded, the primary lateral veins 5- or 6-pairs, slightly impressed above; inflorescences glabrous, sessile or short-pedunculate, laxly multiflowered, up to 4.5 cm. long, with very slender branchlets; pedicels slender, 5–8 mm. long; calyx glabrous, the lobes narrowly lanceolate, up to 1 mm. long; corolla glabrous outside, ovoid in bud, the lobes ascending, narrowly oblong-elliptic or linear-lanceolate, up to 4 mm. long, emarginate at apex, minutely puberulent within (not barbellate); gynostegium subsessile; corona scales narrowly lanceolate, only slightly exceeding the gynostegium.

Guatemala: Dept. Baja Verapaz: Union Barrios, in high forest on top of hill, east of km. 154, June 8, 1975, *C. L. Lundell & Elias Contreras 19401* (LL, type), vine, flowers whitish, aromatic.

Related to *C. Schlechtendalii* (Dcne.) Standl. & Steyerm., *C. eulaxiflorum* differs in its large laxly multiflowered inflorescences and larger flowers with corolla lobes rather obscurely puberulent within, not barbellate.

NEW SPECIES OF EUPATORIUM (ASTERACEAE) FROM NORTHCENTRAL MEXICO

B. L. Turner[1]

In working up the tribe Eupatorieae for Dr. M. C. Johnston's forthcoming floristic study of the Chihuahuan Desert, the following new taxa were encountered:

Eupatorium miquihuanum B. L. Turner, sp. nov. — Fruticulus ad 100 cm. altus, rami fusci flexibiles tuberculati basibus petiolorum perdurantibus; folia viridia fide collectoris glutinosa constanter opposita brevipetiolata incrassata reticulata conferta, laminae ellipticae vel elliptico-obovoideae 15–30 mm. longae 6–12 mm. latae sparse glandulari-punctatae distaliter serratae; capitulescentia cymosa vel subumbellata terminalia capitulis 2–4 pallide roseolis, pedunculis glabris glutinosis 8–15 mm. longis; involucrum in sicco 8–9 mm. longum 5–7 mm. latum anguste campanulatum, 4-seriatum, phyllariis valde inaequalibus apicibus rotundatis vel late obtusis; rami styli elongati, appendicibus linearibus minute papillosis partibus stigmaticis 3-plo longioribus; achaenia angusta 3–4 mm. longa costis principalibus 5; setae pappi ca. 30 saepe roseolae ca. 7 mm. longae.

Small shrub up to 100 cm. tall, stems dark, pliant, the persistent petiolar bases lending a knobby appearance; foliage bright green and reportedly glutinous; leaves all opposite, shortly petiolate, thickened and reticulately veined, much longer than the telescoped internodes; blades elliptic to elliptic-obovoid, 15–30 mm. long, 6–12 mm. wide, sparsely glandular-punctate, denticulate from about the middle upwards; petioles thick, 2–5 mm. long, flaring below and connate with the opposite petiole, at abscission forming a prominent, circumcauline, raised scar; heads pinkish, borne 2–4 in a cymose or sub-umbellate, terminal, capitulescense, the peduncles glabrous, glutinous, 8–15 mm. long; involucre (pressed), 5–7 mm. wide, 8–9 mm. long, narrowly campanulate; involucral bracts glabrous, imbricate, gradate, in ca. 4 series, the inner-most pinkish and with scarious margins, the apices rounded to broadly obtuse; receptacle flat, glabrous; florets pinkish, ca. 20 per head; corolla 5-lobed, glabrous, ca. 7 mm. long, the tube indistinct; anthers ca. 1.8 mm. long with broadly ovate, rounded, apical appendages; style branches elongate, the stigmatic portion ca. 1/3 as long as the minutely papillose, linear appendages; achenes slender, 3–4 mm. long, with 5 principal ribs; pappus of ca. 30, often quite pinkish, bristles, mostly ca. 7 mm. long.

Mexico: Tamaulipas, on east and south slopes and summit of Pena Nevada, July 19, 1949, *L. R. Stanford, L. A. Taylor & S. M. Lauber 2543* (TEX, holotype). Additional specimens examined: Tamaulipas, on mountain top 7 km. S.W. of Miquihuana at 3430 m. in forest of large pines, Aug. 5, 1941, *Stanford, Retherford & Northcraft 688* (G).

A very distinct species, in habit and foliage suggestive of a dwarf form of *E. viburnoides* DC. and perhaps most closely related to that taxon to judge from floral details. The specific epithet is derived from the principal

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village of the region which, according to collectors and maps, takes on various spellings. I have selected that accepted by Henrickson and Straw (1976. A Gazetteer of the Chihuahuan Desert Region, California State Univ., Los Angeles 90032).

Eupatorium astillerum B. L. Turner, sp. nov. — A *E. miquihuanum* foliis amplioribus 25–40 mm. longis 10–25 mm. latis, petiolis longioribus 5–10 mm. longis, internodiis saepe longioribus, capitulis numerosioribus, capitulescentiis 4–10-capitatis, floribus albis, phyllariis angustioribus (saepe linearibus) ciliatis differt.

Resembling *E. miquihuanum* but differing in having larger (25–40 mm. long, 10–25 mm. wide) leaves with longer petioles (5–10 mm.), generally longer internodes, more numerous heads (4–10) to a capitulesence, white florets and more linear, ciliate involucral bracts.

Mexico: Zacatecas, Sierra del Astillero (approached from the southeast, from Tanque El Alto), ca. 24° 3′ Lat., 101° 05′ Long., 2500–3195 m., July 2, 1973, *M. C. Johnston, T. L. Wendt & F. Chiang C. 11568* (LL, holotype).

This and the above taxon make a well-marked species-pair which are almost certainly derived from the same phyletic stock. Both are rare, montane species, occur within 120 kilometers of each other, being associated with pine and oak forests at about 3000 meters. Because of its very restricted distribution I name it after the mountain on which it is found.

Eupatorium flourensifolium B. L. Turner, sp. nov. — Fruticulus in parte superiore glutinosissimum; caules glabri minute verruculosi; folia omnino opposita glabra glutinosissima epunctata anguste elliptica vel oblanceolata integra vel grosse serrata 30–50 mm. longa, 5–15 mm. lata, indistincte subpetiolata; capitulescentia terminalia ca. 20-capitata; involucrum turbinatum 2-seriatum phyllariis ca. 15 subaequalibus; capitula 13–15-flora; receptaculum nudum planum glabrum; corolla in alabastro glabra; achaenia 5-angulata pubescentia costis dense pubescentibus; pappi setae ca. 30 conspicue setuliferae.

Small shrub, foliage and capitulescense very glutinous; stems glabrous, minutely warty; leaves opposite throughout, glabrous, not punctate, narrowly elliptic to oblanceolate, entire to coarsely and irregularly serrate, 30–50 mm. long, 5–15 mm. wide, the blade gradually tapering into an indistinct petiole; capitulescence terminal, of ca. 20 heads; involucre turbinate; bracts equal, linear-lanceolate, ca. 15 in a series; heads 13–15-flowered; receptacle naked, flat, glabrous, corolla (in bud only) glabrous; achenes 5-angled, pubescent, especially along the ribs; pappus of ca. 30 prominently setiferous bristles.

Mexico: Coahuila, Sierra de la Gloria, Cañon El Cono, a side branch of Cañon Chiltipin, draining in North from El Chiltipin, "at lowest pour-off in steep-walled limestone canyon," 26° 49′ North latitude, 101° 15′55″ West longitude, 1300 m., Sept. 6, 1976, *T. L. Wendt & D. Riskind 1619* (TEX, holotype).

Additional specimen examined from 60 km. west of type locality: Coahuila, Sierra de San Marcos, opposite Los Fresnos, northeast-facing slope, Apr. 4–5, 1969, *Pinkava et al. 6082* (LL).

The taxon is quite distinct and in its vegetative state looks very much like a species of the genus *Flourensia,* especially the holotype with its coarsely serrate, very glutinous leaves. The only other specimen examined is much past flower, but one or two achenes are available from the persistent heads to permit an adequate description of the species.

Grateful acknowledgement is made to Prof. M. C. Johnston for the Latin diagnoses.

LEPIDOSPARTUM BURGESSII (ASTERACEAE, SENECIONEAE), A REMARKABLE NEW GYPSOPHILIC SPECIES FROM TRANS-PECOS TEXAS

B. L. TURNER[1]

The following taxon represents a new generic record for the state of Texas; because of its scarcity it should be added to the government's register of threatened and endangered species.

Lepidospartum Burgessii B. L. Turner, sp. nov. — Frutex argenteo-albus ad 7 dm. altus; caules validi ramosissimi, pubescentia dense arachnoidea albo-canescens pustulis oleosis numerosis emergentibus; folia acicularia alterna saepe 5–12 mm. longa ad 1 mm. lata; rami unusquisque scoparioideus apice 1–4-capitulatus capitulis sessilibus trifloris; involucrum turbinatum ca. 1 cm. longum; receptaculum planum nudum; phyllaria dimorphica, exteriora 6–7 minora ca. 3-seriata imbricata, interiora 3 subaequalia apice obtusa vel rotundata mediane valde incrassasta basi concava unumquidque flore amplectens; flores hermaphroditi actinomorphi; corolla ca. 10 mm. longa tubulo paululum crasso ca. 6 mm. longo, limbo abrupte expanso profunde 5-lobulato, lobulis apice-mediane prominentis ut videtur oleosis; antherae ca. 3 mm. longae basi caudatae appendiculibus prominentis lanceolatis; stylus crassus elongatus, ramis lineario-lanceolatis ca. 2 mm. longis, lineis stigmaticis conspicuis prominentibus, appendiculibus brevipubescentibus sensim transientibus; achaenia immatura fusiformia ca. 4 mm. longa dense pubescentia pilis 4–7 mm. longis setiformibus; pappus setis 30–40 minute setulosis 8–9 mm. longis.

Silvery-white shrub up to 7 dm. tall; stems stout, much-branched, densely white, matted-canescent, out of which protrude numerous small blisters filled with thick, oily substances; leaves acicular, alternate, mostly 5–12 mm. long and less than 1 mm. across; heads 1–4, terminal and axillary (sessile) at or near the apices of broom-like branches; involucre turbinate, ca. 1 cm. long, comprised of ca. 10 bracts, the outer 6 or 7 much-reduced and imbricate in ca. 3 series, the much-longer, inner 3 bracts equal in length, obtuse or rounded at the apex and quite thickened medially; receptacle flat, naked, producing only 3 florets, each lying within its concave, subtending, involucral bract; florets perfect, non-ligulate; corolla ca. 10 mm. long, tube stout, ca. 6 mm. long, the limb

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abruptly flaring, deeply 5-lobed, the apices of each possessing a raised, elongate, medial, seemingly oil-filled tissue; anthers ca. 3 mm. long, basally caudate; apical appendages prominent, lanceolate; style stout, elongate; branches linear-lanceolate, ca. 2 mm. long with well-defined, raised stigmatic lines which grade into the terminal, short-pubescent appendage; achenes (immature) fusiform, ca. 4 mm. long, densely covered with long (4–7 mm.) white, bristly hairs; pappus of numerous (30–40), minutely setulose bristles, 8–9 mm. long.

Texas: Hudspeth Co., Salt Basin, ca. 1/2 km. E. of ridge on E. margin of dry lakebed, 7 3/4 km. S., 14 1/4 km. E. of Dell City, "scarce shrub" on crest of low gypseous ridge with *Atriplex canescens*, *Sporobolus airoides* and *Tiquilia (Coldenia) hispidissima*, Dec. 9, 1976, *T. L. Burgess 4432* (LL, holotype; G, UC, isotypes).

This is an unexpected new addition to the State's flora, the genus heretofore being known by only two species from the inter-montane deserts of Arizona, southern California, Nevada, Utah and adjacent Mexico. It is, as indicated by the collector, gypsophilic, very rare endemic of trans-Pecos, Texas.

The species is remarkable for its pustulate stems and consistently 3-flowered receptacle and 3 prominent involucral bracts which, at maturity, superficially resemble the fruiting structure of *Fouquieria* species. Because of these several principal features and its geographic isolation, it might be distinguished as a monotypic generic element. However, *L. Burgessii* is clearly related to *L. latisquamum* S. Wats., the two being more closely related to each other than either is to *L. squamatum* (Gray) Gray, the type element of the genus. Thus a case might be made for their treatment as subgenera along the lines indicated, but bigeneric elevation would seem a needless nomenclatural proliferation.

Dr. John Strother has informed me that a specimen ("Albes", Texas, July 27, 1927, *V. L. Cory 2560*, G) of *Lepidospartum Burgessii* was examined by him in his study of the genus. However, since the material was fragmentary and poorly documented as to origin (there is no locality called "Albes" in Texas), Strother identified the plant as questionably *L. squamatum*, with the comment, "Surely not from Texas." More recently, Dr. L. Anderson found yet another sheet (Hudspeth Co., "W. of Ables", July 29, 1927, *Cory 2548*, TAES) which clearly indicates that Cory obtained material of *L. Burgessii* which he took to be a species of *Chrysothamnus*. Strother states that there is a community of Ables about 3 miles N.N.W. of the intersection of US Highway 62 and the Hudspeth-Culberson County line. In any case, I have examined the (G) sheet and it is, indeed, *L. Burgessii*, much as Strother surmized, and I am grateful to him for calling this record to my attention.

This extraordinary, very distinct, endemic should be added to the formal governmental list of Rare and Endangered Species. It is named for the discoverer, an active naturalist and part-time student working out of Texas Tech University, who has taken pains to secure proper flowering material for examination.

Supported, in part, by National Science Foundation Grant 71-01088.

STUDIES OF AMERICAN PLANTS – XV

CYRUS LONGWORTH LUNDELL

From the La Cumbre area of the great rain forest of southeastern Peten, an extension of the Maya Mountains, many remarkable endemic species have been described. During the Guatemala-British Honduras boundary survey in the 1930's, to the east of La Cumbre, William A. Schipp was the first to explore this rich forest. He made notable plant discoveries, mostly described by Paul C. Standley. Exploration of the Peten side of the boundary since 1959, when I collected in the San Luis area, has been continued with Elias Contreras, my field assistant.

With giant trees of the wet forest towering up to two hundred feet, collecting is very, very difficult, for the trees can not be felled and climbing them is hazardous. Many trees of lower tiers tower above one hundred feet in the valleys. Hence most of the collecting of necessity must be done along streams and on the top of hills where the vegetation is more accessible.

CAPPARIDACEAE

Capparis mayana Lundell, sp. nov. – Arbor parva, brunneo-lepidota; folia petiolata, petiolo 1.5–3 cm. longo; lamina coriacea, supra novella stellato-tomentosa, glabrata, subtus dense lepidota, elliptica, oblongo-elliptica vel oblanceolata, 8.5–16 cm. longa, 2.8–6 cm. lata, apice acuta vel acuminata, basi obtusa, nervis lateralibus ca. 12-jugis; inflorescentia axillaris, corymbosa, longipedunculata, dense lepidota, ad 15 cm. longa; pedicelli ad 3.5 cm. longi; sepala in alabastro aperta, 2–2.5 mm. longa; petala obovata, ca. 1.2 cm. longa, stellato-pubescentia; stamina ca. 15, ad 1.2 cm. longa; ovarium albo-lepidotum.

Small tree, the branchlets stout, angled, brown-lepidote with conspicuous scales; leaves petiolate, the petioles canaliculate, up to 3 cm. long; leaf blades greenish above and finely stellate-tomentose at first, glabrate, much paler and brownish beneath, persistently lepidote, mostly oblong-elliptic, up to 16 cm. long, 6 cm. wide, apex usually subabruptly acuminate, base broadly obtuse, the midvein sulcate above, elevated beneath, the primary lateral veins very slender, usually about 12 pairs, the venation very fine and not elevated, laxly reticulate, obscure above; inflorescences axillary, consisting of single large corymbs equalling the leaves, multi-flowered, with peduncles up to 10 cm. long, brownish-lepidote; pedicels straight, 1.5–3.5 cm. long; sepals free in bud almost to base, brown-lepidote, up to 2.5 mm. long, narrowly triangular, acutish; petals obovate, about 1.2 cm. long, finely stellate-pubescent on both surfaces; stamens equalling petals, the filaments glabrous except at base; gynophore and ovary lepidote with white scales.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, south of Rio Pusila Road about 3.5 km., March 21, 1977, *C. L. Lundell & Elias Contreras 20630* (LL, type), small tree, 20 ft. high, 3 in. diam., flowers whitish.

The taxon must be related to *C. calciphila* Standl., known to me only from description. The acuminate leaves with inconspicuous venation, the

multi-flowered single corymbs, and the elongate pedicels up to 3.5 cm. long (post anthesis) appear to be features distinguishing *C. mayana*. The tree, with its large inflorescences of white flowers, is very attractive.

BOMBACACEAE

Hampea bracteolata Lundell, sp. nov. – Arbor dioecia, ramulis dense tomentellis; stipulae lineares, ad 1.2 cm. longae; folia integra, petiolata, petiolo 3–7 cm. longo; lamina chartacea, ovato-elliptica vel late lanceolata, 12–20 cm. longa, 5.5–9 cm. lata, apice acuminata, basi late obtusa vel rotundata, 3- vel 5-nervia, glabrata supra, puberula sparse infra (praesertim in nervis), nectaria foliorum 3, inconspicua; pedicelli fructiferi 1 vel 2 in axillis foliorum dispositi, ad 3.5 cm. longi; bracteolae involucralium 3, lineares, ad 9 mm. longae; calyces 5-lobati, 6–8 mm. longi, minute tomentelli; corolla ca. 1.7 cm. longa, extus dense tomentella, intus basi barbata, lobis ca. 1.2 cm. longis, intus glabris; capsula subglobosa, minute tomentella, 3-locularis, stipitata; semina glabra, in loculo solitaria.

Tree up to 15 m. tall, 25 cm. diam., the branchlets stout, minutely tomentose with brownish stellate trichomes; stipules linear, up to 1.2 cm. long, sometimes subspatulate apically; leaves entire, with stout petioles up to 7 cm. long, the petioles pubescent like the branchlets; leaf blades chartaceous, ovate-elliptic or broadly lanceolate, up to 20 cm. long, 9 cm. wide, acuminate at apex, broadly obtuse or rounded at base, with 3 prominent nerves and usually with 2 weaker nerves, the 3 prominent nerves with small nectaries, the central nectary 3–4 cm. above base, the two lateral nerves with nectaries 1–2 cm. above base, with persistent small stellate hairs on nerves above, at maturity with rather sparse minute stellate hairs beneath especially on nerves, domatia sometimes present and conspicuous; pedicels of fruits 1 or 2 in leaf axils, up to 3.5 cm. long (immature fruit); calyx campanulate, up to 8 mm. long subtending fruits, splitting into 5 lobes, minutely stellate-tomentose, with three large nectaries at base above which the bracteoles attach, the bracteoles up to 9 mm. long, linear or subspatulate, equalling or longer than calyx, persistent; corolla of pistillate flowers about 1.7 cm. long, constricted above basal tube, puberulent on outer surface, glabrous within but barbate around staminal column and at base of lobes, the lobes about 1.2 cm. long, subsagittate at base; staminal column about 3 mm. long, barbate at base; style recurved, slender, clavate, glabrous above; capsules (immature) subglobose, pale, greenish, minutely puberulent, stipitate, apiculate; suture of capsule with dense fringe of hairs, the inner wall sometimes pubescent with conspicuous hairs, usually glabrous; capsule 3-celled, with 1 glabrous seed in each locule.

Guatemala: Dept. Baja Verapaz, Niño Perdido, in high forest on top of hill, east of km. 150/151 of Coban Road, Aug. 29, 1975, *C. L. Lundell & Elias Contreras 19756* (LL, type), tree, 50 ft. high, 10 in. diam., fruit greenish; same locality, on Cerro Verde, Dec. 3, 1976, *Lundell & Contreras 20427* (LL).

Although the throat of corolla is barbate around the base of staminal tube in pistillate flowers and at base of corolla lobes, the leaves do not

have auricular appendages, so I refer *H. bracteolata* to section *Hampea*, series *Watsonia* of Fryxell (Brittonia 21: 359–396. 1969). It appears to be a local montane endemic related to *H. sphaerocarpa* Fryxell, differing immediately in the fewer primary nerves of leaves with only three nectaries located near base, in having elongated stipules, persistent bracteoles usually longer than calyx, and in its larger pistillate corolla about 1.7 cm. long. The 3-celled capsules with 1 seed in each locule indicates the affinity to *H. sphaerocarpa*, a taxon which Fryxell reports from Alta Verapaz, Guatemala (l.c. p. 382).

Hampea ovatifolia Lundell, Wrightia 4: 140. 1970.

Guatemala: Dept. Peten, La Cumbre, in high forest on top of rocky hill, west of km. 142 of Cadenas Road, Aug. 9, 1969, *Elias Contreras 8877* (LL, type), tree, 35 ft. high, 3 in. diam., fruits greenish; La Cumbre, in *zapotal*, west of km. 142/143, 500 m. from Cadenas Road on top of hill, Sept. 9, 1975, *C. L. Lundell & Contreras 19822* (LL), small tree, 35 ft. high, 5 in. diam., corolla white (staminate fls.); La Cumbre, Cerro Tzul, in *zapotal* on top of hill, Pusila Road east, Aug. 16, 1976, *Lundell & Contreras 20168* (LL), tree, 20 ft. high, 4 in. diam., corolla white (staminate fls.); La Cumbre, in *zapotal* on top of hill, about 4.5 km. north of Pusila Road, Aug. 30, 1976, *Lundell & Contreras 20276* (LL), tree, 30 ft. high, 4 in. diam., flowers white, "*majagua*."

Closely related to *H. trilobata* Standl., the species belongs in section *Hampea*, series *Preslia* of Fryxell (l.c.). *H. ovatifolia*, an understory tree in the high rain forest of southeastern Peten, appears to be a local endemic of the Maya Mountains, occupying a niche south of the range of *H. trilobata*.

In *Lundell & Contreras 20276* the single foliar nectary is located as much as 1.5 cm. above base of blade, but in the type and other specimens the nectary is basal or nearly so, as in *H. trilobata*.

SAPOTACEAE

Mastichodendron eucuneifolium Lundell, sp. nov. — Arbor, ramulis crassiusculis; folia glabra, petiolata, petiolo 1–2.3 cm. longo; lamina coriacea, elliptica vel lanceolato-elliptica, 6–11 cm. longa, 2.5–4.7 cm. lata, apice late obtusa vel rotundata, basi eucuneata, revoluta, nervis lateralibus 8–12-jugis; pedicelli fructiferi crassi, 6–7 mm. longi; sepala 5, crassa, late rotundata vel rotundata, exteriora ca. 1.3 mm. longa, interiora ad 2 mm. longa; fructus subglobosus, ad 1.7 cm. diam.

A giant tree, up to 40 m. high, about 1 m. diam., the branchlets slender above, thickened below, with reddish-sericeous buds at apex, otherwise glabrous at maturity; leaves glabrous, with slender petioles up to 2.3 cm. long, shallowly grooved above, subterete, narrowly margined above by the decurrent leaf blade; leaf blade coriaceous, elliptic or lanceolate-elliptic, sometimes obovate-elliptic, up to 11 cm. long, 4.7 cm. wide, apex broadly obtuse or rounded, the base cuneate, revolute, and narrowly decurrent on petiole, the midvein shallowly sulcate above, nearly plane, conspicuous and elevated beneath, the primary lateral veins 8–12-pairs, rather slender and inconspicuous, nearly straight and ascending at a wide angle, es-

sentially smooth on upper surface; fruits axillary, on old wood; pedicels rather stout, 6–7 mm. long, straight; sepals 5, thick, the outer smaller and broadly rounded, about 1.3 mm. long, the inner rounded, up to 2 mm. long; fruits subglobose or ovoid, up to 1.7 cm. diam.; seed 1, smooth, with basilateral oval seed-scar about 5 mm. long, 3.5 mm. diam.

Guatemala: Dept. Peten, San Luis, in *zapotal* bordering Arroyo Quebrada Seca, km. 122 of Cadenas Road, March 28, 1977, *C. L. Lundell & Elias Contreras 20710* (LL, type), 125 ft. high, 35 in. diam., laticiferous.

The specimens bear only dry fruits, but on the basis of the small oval basilateral seed-scar, 5-parted calyx, and the characteristics of the leaves, I refer the taxon to *Mastichodendron*. It can not be confused with any other species of the family known from the Maya Area.

ASCLEPIADACEAE

Matelea mayana Lundell, sp. nov. – Herbae volubiles, graciles, ramosae, puberulentes; folia chartacea, lanceolata, ad 6 cm. longa, 2.2 cm. lata, apice acuta vel acuminata, basi acuta vel obtusa, utrinque parce adpresse hispidula; petioli ad 1.3 cm. longi; inflorescentiae axillares, pedunculatae, racemoso-subumbellatae, 1–3-florae; pedicelli ad 1 cm. longi; calyx lobatus, lobi angusti lanceolati, ad 2 mm. longi; corolla rotata, 5-lobata, lobis ellipticis, 4–5 mm. longis, apice rotundatis et emarginatis; corona corollae 5-lobata, ca. 3.5 mm. lata; folliculi ignoti.

Slender vine, the stems minutely rugose, at first puberulent and hispidulous with retrorse appressed hairs; leaves small, petiolate, the petioles slender, up to 1.3 cm. long, pubescent; leaf blades chartaceous, whitened beneath, hispidulous above with antrorse hairs, the hairs sparse except along midvein, nearly glabrous beneath except along costa, narrowly lanceolate, 3–6 cm. long, 1–2.2 cm. wide, apex acute or acuminate, base acute or obtuse, the midvein elevated beneath, the primary lateral veins 5–9-pairs, arcuately ascending, slender; inflorescence axillary, appressed hispidulous, the peduncle stout, 1–3 mm. long; flowers 1–3, racemose-subumbellate; pedicels up to 1 cm. long; calyx lobate, the lobes linear-lanceolate, up to 2 mm. long, acute or obtuse, sparsely hispidulous; corolla rotate, 5-lobate, drying dark green, veiny, the lobes elliptic, 4–5 mm. long, rounded and emarginate at apex, glabrous except for a few minute appressed hairs on outer surface; corona sharply 5-lobed, up to 3.5 mm. wide; stigma pentagonal, about 2.5 mm. wide.

Guatemala: Dept. Peten, La Cumbre, in *zapotal* on top of hill, 4 km. east on Rio Purula Road, Sept. 21, 1975, *C. L. Lundell & Elias Contreras 19904* (LL, type), vine, flowers brownish.

M. mayana appears to be related to *M. campechiana* (Standl.) Woodson, differing in its small leaves, hispidulous pubescence, 1–3-flowered short pedunculate inflorescence, longer pedicels, and linear-lanceolate calyx lobes.